

# EXHIBITS

**Exhibit A**      Final CCAA Policy

**Exhibit B**      NEPA

**Exhibit C**      NEPA - Environmental Assessment

**Exhibit D**      Section 7 Consultation

**Exhibit E**      Federal Register Notice Announcing Receipt of  
Permit Application and Comment Period

**Exhibit F**      Findings

**Exhibit G**      Permit

result in listed species occupying adjacent properties.

The Services will use the maximum flexibility allowed under the Act in addressing neighboring properties under Safe Harbor Agreements and associated take authorizations, including, but not limited to, granting of incidental take authority to the owners of neighboring lands, where occupation of neighboring lands is expected as a result of the Agreement. Neighboring landowners would only be required to agree to such conditions as would be necessary to ensure that the Agreement does not circumvent those obligations or requirements, if any, under section 9 of the Act that were applicable at the time the Agreement was signed. Implications to neighboring landowners with non-enrolled lands will be determined on a case-by-case basis, and the Services will make every effort to include them as a signatory party to the Agreement and enhancement of survival permit when the occupation of their lands by covered species is expected. For neighbors to receive the Safe Harbor Assurances, they would sign an Agreement with the following requirements: (1) Allow an assessment/establishment of the baseline on their properties with concurrence by all parties, (2) notify the Services prior to significantly modifying the habitat, and (3) allow the Services access to capture and translocate individuals of the covered species on their property that would be expected to be adversely affected by those habitat modifications. To facilitate neighboring landowner's participation, the Services will encourage them to become signatory parties to these Agreements, where appropriate.

#### *Part 15. Will There Be Public Review?*

The Services will encourage property owners to involve the public in the development of an Agreement. However, public participation must be agreed to by the property owner. The Services will make every Safe Harbor Agreement available for public review and comment as part of the evaluation process for issuance of the associated enhancement of survival permit. This comment period will generally be 30 days; with the comment period for large or programmatic Agreements 60 days.

#### *Part 16. What Is the Scope of the Policy?*

This policy applies to all Federally-listed species of fish and wildlife administered by the Services, as provided in the Act and its implementing regulations.

Dated: March 22, 1999.

**Jamie Rappaport Clark,**  
*Director, U.S. Fish and Wildlife Service.*

Dated June 10, 1999.

**Penelope D. Dalton,**  
*Assistant Administrator of Fisheries, National Marine Fisheries Service.*

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

### National Marine Fisheries Service

#### **Announcement of Final Policy for Candidate Conservation Agreements with Assurances**

AGENCY: Fish and Wildlife Service, Interior; National Marine Fisheries Service, NOAA, Commerce.

ACTION: Announcement of final policy.

**SUMMARY:** The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (jointly the Services) announce a joint final Policy for Candidate Conservation Agreements (Agreements) with Assurances under the Endangered Species Act of 1973, as amended (Act). This policy offers assurances as an incentive for non-Federal property owners to implement conservation measures for species that are proposed for listing under the Act as threatened or endangered, species that are candidates for listing, and species that are likely to become candidates or proposed in the near future. Published concurrently in this *Federal Register* are the FWS's regulations necessary to implement this policy.

**DATES:** This policy is effective July 19, 1999.

**ADDRESSES:** Chief, Division of Endangered Species, U.S. Fish and Wildlife Service, 1849 C Street, N.W., Washington, D.C. 20240 (Telephone 703/358-2171, Facsimile 703/358-1735); or Chief, Endangered Species Division, National Marine Fisheries Service, Office of Protected Resources, 1315 East-West Highway, Silver Spring, MD 20910 (Telephone 301/713-1401, Facsimile 301/713-0376).

**FOR FURTHER INFORMATION CONTACT:** Richard Hannan, Acting Chief, Division of Endangered Species, U.S. Fish and Wildlife Service (Telephone 703/358-2171) or Marta Nammack, Endangered Species Division, National Marine

Fisheries Service (Telephone 301/713-1401).

#### **SUPPLEMENTARY INFORMATION:**

##### **Background**

On June 12, 1997, the Services issued a draft policy (62 FR 32183), and the FWS issued proposed regulations to implement the policy (62 FR 32189). This policy is intended to facilitate the conservation of proposed and candidate species, and species likely to become candidates in the near future by giving citizens, States, local governments, Tribes, businesses, organizations, and other non-Federal property owners incentives to implement conservation measures for declining species by providing certainty with regard to land, water, or resource use restrictions that might be imposed should the species later become listed as threatened or endangered under the Act. Under the policy, non-Federal property owners, who enter into a Candidate Conservation Agreement with assurances that commit them to implement voluntary conservation measures for proposed or candidate species, or species likely to become candidates or proposed in the near future, will receive assurances from the Services that additional conservation measures will not be required and additional land, water, or resource use restrictions will not be imposed should the species become listed in the future.

Much of the land containing the nation's existing and potential fish and wildlife habitat is owned by private citizens, States, local governments, Native American Tribal governments, businesses, organizations, and other non-Federal entities. The future of many declining species is dependent, wholly or in part, on conservation efforts on these non-Federal lands. Such conservation efforts are most effective and efficient when initiated early. Early conservation efforts for proposed and candidate species, and species likely to become candidates or proposed in the near future can, in some cases, preclude or remove any need to list these species as threatened or endangered under the Act.

By precluding or removing any need to list a species through early conservation efforts, property owners can maintain land use and development flexibility. In addition, initiating or expanding conservation efforts before a species and its habitat are critically imperiled increases the likelihood that simpler, more cost-effective conservation options will still be available and that conservation will ultimately be successful.



Early conservation efforts for declining species can be greatly expanded through a collaborative stewardship approach. A collaborative approach fosters cooperation and facilitates the exchange of ideas among private citizens, Federal agencies, States, local governments, Tribes, businesses, and organizations by involving all stakeholders in the conservation planning process.

Candidate Conservation Agreements without assurances have been effective mechanisms for conserving declining species, particularly candidate species, and have, in some instances, precluded or removed any need to list some species. Development of Agreements without assurances will continue to be a high priority. However, most of these Agreements have been between the Services and other Federal agencies since non-Federal property owners have had little incentive to enter such Agreements. Many non-Federal property owners are willing to manage their lands to benefit fish, wildlife, and plants, especially those species that are declining. However, some of these property owners are reluctant to implement conservation measures for declining species because of possible future land, water, or resource use restrictions that may result from the Act's section 9 "take" prohibitions if their conservation efforts cause a species to colonize their lands or increase in numbers and the species is subsequently listed as threatened or endangered. This policy is designed to provide these property owners with the necessary assurances to remove these concerns and encourage them to implement conservation measures for these species.

Non-Federal property owners, who through a Candidate Conservation Agreement with assurances commit to implement conservation measures for a proposed or candidate species or a species likely to become a candidate or proposed in the near future, will receive assurances from the Services that additional conservation measures will not be required and additional land, water, or resource use restrictions will not be imposed should the species become listed in the future. These assurances will be provided in the property owner's Agreement and in an associated enhancement of survival permit issued under section 10(a)(1)(A) of the Act.

The Services must determine that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if

it is assumed that conservation measures were also to be implemented on other necessary properties, would preclude or remove any need to list the covered species. "Other necessary properties" are other properties on which conservation measures would have to be implemented in order to preclude or remove any need to list the covered species.

The kinds of conservation measures specified in an Agreement with assurances will depend on the types, amounts, and conditions of, and need for, the habitats existing on the property and on other biological factors. Different kinds of conservation measures may benefit different life stages or serve to fulfill different life history requirements of the covered species. The amount of benefit provided by an Agreement with assurances will depend on many factors, particularly the size of the area on which conservation measures are implemented and the degree of conservation benefit possible (e.g., through habitat restoration or reduction of take). For example, an Agreement with assurances for a property with a small area of severely degraded habitat could be designed to achieve greater benefits than one for a property with a large amount of slightly degraded habitat.

Because Candidate Conservation Agreements with assurances will be designed with the goal of precluding or removing any need to list the covered species, these Agreements can have significance in the Services' listing decisions. However, the determination of whether these Agreements do in fact preclude or remove any need to list the covered species will be made on a case-by-case basis in accordance with the listing criteria and procedures under section 4 of the Act.

Collaborative stewardship with State and Tribal fish and wildlife agencies is particularly important in the development of Candidate Conservation Agreements, given the statutory role of these entities under the Act and their traditional conservation responsibilities and authorities for resident species. The Services recognize that, under some circumstances, a State, Tribal, or local agency or other entity may be able to work more promptly, effectively, and efficiently with individual property owners toward conservation of declining species. Under this policy, the Services can enter into an "umbrella" or programmatic Agreement with an appropriate State, Tribal, or local agency or other entity. Such an Agreement and its associated enhancement of survival permit would specify the assurances and take allowances that could be

distributed by the participating State, Tribal, or local agency or other entity to individual property owners who choose to participate under the umbrella Agreement. Appropriate agencies for such programmatic Agreements include State or Tribal fish and wildlife agencies and State, Tribal, or local land management agencies. The State, Tribal, or local agency or other entity would be the permittee and would issue Certificates of Inclusion (also called Participation Certificates) to private property owners who satisfy the terms and conditions of the State, Tribal, or local agency's or other entity's programmatic Agreement and its associated "enhancement of survival" permit.

The Services have a long history of developing Candidate Conservation Agreements with Federal agencies, and these efforts will continue to be a high priority. However, because subsections 7(a)(1) and (a)(2) of the Act obligate Federal agencies to affirmatively conserve listed species, an obligation not imposed upon non-Federal property owners, the Services will not provide assurances to other Federal agencies through these Agreements.

In 1994, the FWS prepared Draft Candidate Species Guidance, which underwent public review and comment (59 FR 65780, December 21, 1994). However, it did not address the development of Candidate Conservation Agreements with assurances for non-Federal property owners. This final policy will be incorporated into the FWS's final guidance on candidate species conservation.

A final rule of the FWS's regulations necessary to implement this policy is published concurrently in this issue of the *Federal Register*. That final rule also includes the FWS's regulations necessary to implement the Safe Harbor policy (also published concurrently in this issue of the *Federal Register*). The NMFS will publish proposed regulations to implement these policies at a later time.

#### Summary of Comments Received

The Services received more than 280 letters of comment on the draft policy from Federal and State agencies, businesses and corporations, conservation groups, religious organizations, trade associations, private organizations, and individuals. The Services considered all of the information and recommendations received from all interested parties and made changes to the draft policy where appropriate. A few commenters raised issues related to the FWS's draft implementing regulations, and the FWS

has addressed these issues where appropriate in its final implementing regulations also published in today's **Federal Register**. The following is a summary of the comments on the draft policy and the Services' responses.

**Issue 1.** Many commenters stated that the policy is inconsistent with provisions of section 7(a)(1) of the Act that requires all Federal agencies to use their authorities to conserve endangered and threatened species.

**Response 1.** The Services believe that the policy is consistent with provisions of section 7(a)(1) of the Act and enables the Services to further satisfy the intent of this section of the Act. Entering into an Agreement with assurances is completely voluntary for the Services, as it is for property owners. The Services will enter into an Agreement with assurances only if we have determined that the conservation needs for covered species on the participating property owner's property are adequately addressed in the Agreement.

By entering into a Candidate Conservation Agreement with assurances, a property owner can obtain certainty that no additional conservation measures will be required and no additional land, water, and resource use restrictions will be imposed if the species is listed in the future. If they cannot obtain such certainty, some property owners might choose to eliminate or reduce the species' habitat before listing occurs. An Agreement with assurances thus can further the conservation of the covered species because it can prevent such losses of existing habitat.

**Issue 2.** Many commenters believed that the policy is inconsistent with provisions of section 7(a)(2) of the Act because it precludes reinitiation of section 7 consultation on issuance of an enhancement of survival permit. Also, many commenters believed that the Services cannot guarantee that funding will be available to pay for additional conservation measures needed to address unanticipated changes in circumstances.

**Response 2.** The Services believe that the policy is consistent with section 7(a)(2) of the Act. As applied to implementation of this policy, section 7(a)(2) requires the Services to conduct a formal intra-Service consultation on the issuance of an enhancement of survival permit. The purpose of any consultation is to ensure that any action authorized, funded, or carried out by a Federal agency, including the issuance of an enhancement of survival permit by the Services, is not likely to jeopardize the continued existence of any listed or proposed species or result in the

destruction or adverse modification of designated or proposed critical habitat of such species. Since the standard for Candidate Conservation Agreements with assurances is the preclusion or removal of the need to list, the Services believe that it is highly unlikely that the conservation measures prescribed in an Agreement or any incidental take authorized by the associated enhancement of survival permit would later be discovered to adversely affect the covered species or any listed species causing a need to reinitiate intra-Service consultation.

If unanticipated changes in circumstances occur that might warrant modifications to the agreed upon conservation measures, the Services would work with the property owner to seek mutually agreed upon adjustments to those conservation measures that enhance their effectiveness for the covered species. Thus, the Services and property owners could agree to substitute the original agreed upon conservation measures for new ones that would be no more costly but more effective in addressing the changed circumstances. In this fashion, the conservation goal for that property owner's property could still be maintained.

The Services will not enter into an Agreement unless (1) the threats to and the requirements of the covered species are adequately understood so that the Services can determine that the agreed upon conservation measures will be beneficial to the covered species; and the effects of the agreed upon conservation measures are adequately understood so that the Services can determine that they will not adversely affect listed species or adversely modify critical habitat or (2) any information gaps relating to the requirements of the covered species or the effects of the conservation measures on the covered species or listed species can be adequately addressed by incorporating adaptive management principles into the Agreement. The Services believe that, in many Agreements, the conservation measures prescribed for the covered species will also benefit other species, including listed ones.

Moreover, the Services have significant resources and conservation authorities that can be used to address the needs of species covered by Agreements with assurances when unanticipated changes in circumstances cause a need for additional conservation measures. Some funding for additional conservation measures may come from existing appropriations for either candidate conservation or recovery, depending on whether the species is

listed. When necessary, the Services will work with other Federal, State, and local agencies, Tribal governments, conservation groups, and private entities to implement additional conservation measures for the species.

Finally, the Services are prepared as a last resort to revoke a permit implementing a Candidate Conservation Agreement with assurances where continuation of the permitted activity would be likely to result in jeopardy to a species covered by the permit. Prior to taking such a step, however, the Services would first have to exercise all possible means to remedy such a situation.

**Issue 3.** Many commenters believed that the policy precludes adaptive management.

**Response 3.** The Services encourage the inclusion of the principles of adaptive management into Candidate Conservation Agreements with assurances and associated enhancement of survival permits when necessary, especially when new management techniques are being tested. Adaptive management is a process of monitoring the implementation of conservation measures, then adjusting future conservation measures according to what was learned. Adaptive management can also include testing of alternative conservation measures, monitoring the results, and then choosing the most effective and efficient measures for long-term implementation. Inclusion of adaptive management in Agreements allows for up-front, mutually agreed upon changes to conservation measures in response to changing conditions or new information.

By incorporating adaptive management into Agreements with assurances and associated enhancement of survival permits, the Services believe that these Agreements will have sufficient flexibility to enable the Services and property owners to address reasonably foreseeable changes in circumstances or new information.

**Issue 4.** Many commenters stated that Candidate Conservation Agreements with assurances will undermine recovery of the covered species once it is listed.

**Response 4.** The Services believe that this comment reflects confusion regarding the standard required by the policy in all Agreements with assurances. The policy requires the Services to determine that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if



it is assumed that conservation measures were also to be implemented on other necessary properties, would preclude or remove any need to list the covered species. Since this is essentially a recovery standard, each property owner with an Agreement with assurances would contribute to precluding or removing any need to list the covered species. Therefore, if the covered species became listed, these property owners would already be implementing conservation measures that address the covered species' conservation needs on their properties.

**Issue 5.** Many commenters believed that the draft policy limited public participation. Some stated that the draft policy was unclear as to when the Services will solicit comments on Candidate Conservation Agreements with assurances, and some commenters felt that the public should be allowed to participate in the development of all Agreements. In addition, many commenters said that Agreements should be subject to citizen enforcement.

**Response 5.** The Services have changed the policy to clarify when the public will have the opportunity to review and comment on Agreements with assurances. The Services will make every Agreement with assurances available for public review and comment as part of the evaluation process for issuance of the enhancement of survival permit associated with these Agreements. This comment period will generally be 30 days; the comment period for large-scale or programmatic Agreements that may affect other natural resources will be at least 60 days.

The development of an Agreement with assurances consists primarily of the preparation of a proposal by a non-Federal property owner to modify voluntarily their current land management practices so as to restore, enhance, or preserve habitat or to implement voluntarily other conservation measures for declining species. Because development of such a proposal is purely voluntary and involves private land use decisions, public participation in the development of an Agreement with assurances will only be provided when agreed to by the property owner.

However, the Services will encourage property owners to allow for public participation during the development of an Agreement with assurances, particularly if non-Federal public agencies (e.g., State fish and wildlife agencies) are involved. The Services also will encourage State or local agencies or other entities developing

"umbrella" or programmatic Agreements, which would specify the assurances and take allowances that could be further delegated by the State or local agency or other entity to individual participating non-Federal property owners, to provide extensive opportunities for public involvement during the development process.

The public will also be given other opportunities to comment on Agreements in cases that are related to a listing determination. When one or more additional Agreements are completed after the covered species is proposed for listing, and the Services determine, based upon a preliminary evaluation, that all completed Agreements could potentially justify withdrawal of the proposed listing, the comment period for the proposed listing will be extended or reopened to allow for public comments on the Agreements' adequacy in removing threats to the species. The Services believe a preliminary evaluation of the likelihood that the completed Agreements remove the need to list is necessary in order to justify constricting the available time to reach a final determination by extending or reopening the comment period on a proposed rule.

The provisions of the Act providing for citizen suits will be neither enhanced nor diminished in any way by the issuance of this policy because it will be implemented through the enhancement of survival permitting process recognized under the Act. To the extent that the current Act allows for citizen lawsuits to challenge the issuance of a given section 10(a) permit, nothing in this policy would modify or alter that opportunity for possible judicial review.

**Issue 6.** Many commenters stated that all Candidate Conservation Agreements with assurances should undergo independent scientific review.

**Response 6.** In determining the need for independent scientific review, the Services will consider the complexity of the Agreement, the size of the geographic area covered, the number of species covered, the presence of data gaps or scientific uncertainties, and other factors. Scientific experts will often be asked to assist with development of conservation measures and/or to review a draft Agreement. When scientific experts are not specifically solicited to provide comments, such individuals can submit comments during the general public review and comment periods (see Response 5 above). In developing Agreements with assurances, the Services may use existing State conservation plans or strategies that

have undergone scientific review, or the Services may use other scientific information published in peer reviewed journals.

**Issue 7.** Many commenters questioned the authority for and the availability of adequate funding for the implementation of this policy.

**Response 7.** The Services believe that sections 2, 7, and 10 of the Act allow the implementation of this policy. For example, section 2 states that "encouraging the States and other interested parties through Federal financial assistance and a system of incentives, to develop and maintain conservation programs \* \* \* is a key \* \* \* to better safeguarding, for the benefit of all citizens, the Nation's heritage in fish, wildlife, and plants." The Services believe that establishing a program for the development of Candidate Conservation Agreements with assurances provides an excellent incentive to encourage conservation of the Nation's fish and wildlife. Section 7 requires the Services to review programs they administer and to "utilize such programs in furtherance of the purposes of this Act." The Services believe that, in establishing this policy, they are utilizing their Candidate Conservation Programs to further the conservation of the Nation's fish and wildlife. Of particular relevance is section 10(a)(1) which authorizes the issuance of permits to "enhance the survival" of a listed species. From the perspective of the Services, a well designed voluntary Candidate Conservation Agreement is the epitome of conservation efforts designed to "enhance the survival" of the covered species.

Funding is available to implement this policy through annual appropriations. The Services are currently working on Candidate Conservation Agreements without assurances, and with finalization of this policy the Services will use available resources to develop Agreements with assurances as well. The FWS is currently implementing over 40 conservation agreements (without assurances) and actions benefitting over 200 species. Several of these conservation agreements and actions have successfully precluded or removed threats so that listing by the Services was avoided.

The Services will prioritize the development of Agreements with assurances because resources to develop Agreements are limited. Prioritization will help the Services focus on those Agreements that are expected to provide the greatest conservation benefits.

**Issue 8.** Many commenters stated that the policy should require that all

Candidate Conservation Agreements with assurances include monitoring provisions.

*Response 8.* The Services agree that monitoring is necessary to ensure that the conservation measures specified in an Agreement with assurances are being implemented and to learn about the effectiveness of the agreed upon conservation measures. In particular, when adaptive management principles are included in an Agreement, monitoring is especially helpful for obtaining the information needed to measure the effectiveness of the conservation program and detect changes in conditions. For these reasons, monitoring will be a component of most Agreements with assurances. For many of these Agreements, monitoring can be conducted by the Services or the State and, in many cases, may involve only a brief site inspection and appropriate documentation.

*Issue 9.* Many commenters believed that Candidate Conservation Agreements with assurances will wrongly be used to replace recovery plans or warranted listing determinations or to delay the listing process.

*Response 9.* The Services do not intend for Agreements with assurances to replace recovery plans. In fact, in order to facilitate the development of Agreements with individual property owners, the Services may develop a conservation outline, strategy, or plan to determine the measures needed to address the conservation needs of the covered species. If the covered species is later listed, the conservation strategy or plan may form the basis for part or all of a recovery plan.

The Services also do not intend to use Agreements with assurances to justify a determination not to list the covered species when listing is in fact warranted. As described in Response 5, when an Agreement with assurances is completed after the covered species is proposed for listing, and when the Services determine, based upon a preliminary evaluation, that the Agreement could potentially justify withdrawal of the proposed rule, the comment period for the proposed rule will be extended or reopened to allow for public comments on the Agreement's adequacy in removing threats to the species.

However, the Act requires the Services to issue a final determination within 1 year of issuing a proposed rule to list. The FWS is working diligently to remove the backlog of listing actions that accrued following the listing moratorium in 1995 and 1996, and the

FWS expects to soon be able to again make final listing determinations within the 1-year time frame. The Services will not extend this time frame in order to allow for the completion and/or consideration of an Agreement with assurances. The Services believe a preliminary evaluation of an Agreement is necessary in order to justify constricting the available time to reach a final determination by extending or reopening the comment period on a proposed rule.

*Issue 10.* Several commenters stated that the policy should require incorporation of avoidance and minimization of take in all Candidate Conservation Agreements with assurances.

*Response 10.* The Services believe that avoidance and minimization of take is an inherent consideration in the development of any Agreement with assurances. Property owners whose current land, water, or resource use results in take of proposed or candidate species, or species likely to become candidates or proposed in the near future, are a primary focus of this policy. For some Agreements, avoidance and/or minimization of take may be the primary objective. A property owner entering into an Agreement with assurances can be assured that, if the covered species is listed in the future, no additional land, water, or resource use restrictions will be imposed above and beyond the conservation measures set forth in the Agreement. After take is eliminated or reduced, land, water, or resource uses can often provide significant benefits to the covered species. For example, a property owner could eliminate or reduce take of a declining grassland bird species that nests on his property by agreeing to delay mowing until after the nesting season. The species would benefit from successful reproduction, and the property owner would benefit from being able to maintain his current land use even if the species is later listed.

If a property owner exceeds the conservation goal established for his property as specified in an Agreement with assurances, the property owner may choose to reduce the level of conservation benefits he/she has provided to the covered species to a lower level, but one that is still at or above the conservation goal specified in the Agreement. The property owner's enhancement of survival permit would authorize incidental take associated with this reduction of conservation benefits back to the agreed upon level. Prior to issuing the enhancement of survival permit, the Services must determine that the conservation goal for

the property can be maintained with the level of take authorized by the permit. The policy also requires that the Agreement include a notification requirement, if appropriate, to provide the Services or State agencies with a reasonable opportunity to rescue and translocate individuals of a covered species before any authorized take occurs. The Services believe that these provisions will ensure that any authorized take will not prevent a property owner from achieving the conservation goal established for his property and will minimize the amount of authorized take that occurs.

*Issue 11.* Several commenters believed that the policy should list the minimum conditions that must be satisfied before any Candidate Conservation Agreements with assurances are pursued.

*Response 11.* The Services agree with this comment, and the final policy lists the general requirements that all Agreements with assurances and associated enhancement of survival permits should satisfy. In addition, FWS's implementing regulations, which are published in today's **Federal Register**, also list the requirements that must be met before the Services will issue an enhancement of survival permit.

In addition, the FWS's draft Candidate Conservation Handbook includes a list of conditions under which Candidate Conservation Agreements would most likely be successful in eliminating threats and precluding or removing any need to list the covered species. This list would also apply to Agreements with assurances. The Services believe that such a list is more appropriately included in implementation guidance such as the FWS's Candidate Conservation Handbook.

*Issue 12.* Several commenters stated that the policy should not apply to candidate and proposed species because determinations have already been made that these species should be listed, and efforts to develop Candidate Conservation Agreements with assurances would only delay or forego the necessary protection that could be afforded by listing.

*Response 12.* The Services do not believe that Agreements with assurances will delay or forego any actions necessary to achieve conservation of the covered species. In fact, these Agreements will help to garner the necessary support from non-Federal property owners in achieving conservation through voluntary implementation of conservation measures. Additionally, the Services



believe that, for some candidate and proposed species, it is possible to complete the Agreements with assurances necessary to remove the need to list before a final listing determination could be made. These candidate and proposed species may include (1) species for which relatively few, non-complex Agreements are necessary, (2) species for which development of Agreements begins prior to the species becoming a candidate or proposed species, and (3) candidate species that have a low listing priority. Therefore, the Services believe that including candidate and proposed species in this policy is appropriate. However, for the Services to justify withdrawal of a proposed rule to list, the parties to all Agreements with assurances for the covered species must have the authority, funding, and commitment to implement the Agreements.

As of April 30, 1999, there were 154 FWS candidate species awaiting preparation of proposed rules and 69 FWS proposed species awaiting preparation of final rules. Final listing of many of these species, as well as many of the species that will be added as candidates or proposed species in the future, will require considerable time. The FWS believes that initiating early conservation efforts, including the development of Agreements with assurances, for some of these species will significantly increase the likelihood that conservation will be successful.

*Issue 13.* Several commenters asked how the conservation goal for each property owner's property can be determined without preparing a recovery plan.

*Response 13.* The Services believe it may be appropriate in some cases to prepare a conservation outline, strategy, or plan for a species before an Agreement with assurances is developed. In some cases, a conservation strategy or plan may already have been developed by the Services, another Federal agency, and/or a State agency. These strategies or plans may already have identified measures that should be implemented to conserve the covered species. In these cases, development of Agreements with assurances can be initiated right away.

*Issue 14.* Some commenters argued that a property owner could destroy habitat for candidate or proposed species, and then request a Candidate Conservation Agreement with assurances based on a lower starting baseline. Also, some commenters suggested that property owners may threaten to destroy habitat unless Agreements are written their way.

*Response 14.* The Services will not enter into any Agreement with assurances that does not meet the minimum standards established by this policy and its implementing regulations. Entering into an Agreement with assurances is voluntary for the Services and property owners; the Services will refuse to enter into an Agreement that does not meet the minimum established standards. Also, because the conservation goal for a property owner's property is not based solely on the amount of currently suitable habitat present, destroying habitat will likely only make it more difficult for the property owner to achieve the conservation goal for his property. Removing threats and taking actions consistent with the goal of precluding or removing any need to list would only be made more arduous by an initial destruction of habitat. Finally, the Services do not believe that it is credible to suggest that a property owner who is otherwise interested enough in declining species conservation to consider entering into an Agreement is likely to go in and first destroy portions of the species' habitat before entering into an Agreement.

*Issue 15.* Some commenters stated that the standard for Candidate Conservation Agreements with assurances should be to increase the likelihood that the species will survive rather than to preclude or remove any need to list.

*Response 15.* The Services believe that the overall goal for Agreements with assurances developed under this policy should be to remove threats to the covered species so as to preclude or remove any need to list the species. The Services believe that the policy must incorporate this standard in order to justify the expenditure of resources to develop and evaluate Agreements with assurances, process associated enhancement of survival permits, and allow the Services to provide assurances to the property owner.

*Issue 16.* Some commenters stated that the Services must conduct National Environmental Policy Act (NEPA) analyses for all Candidate Conservation Agreements with assurances and enhancement of survival permits.

*Response 16.* The Services believe that implementation of this policy must comply with NEPA. The Services have determined that most of these Agreements will be categorically excluded under the Department of Interior Departmental Manual (DM) NEPA procedures in 516 DM 2, Appendix 1.10 and under NOAA Administrative Series 216-6, Sections 602b.3 and 602c.3. The Services expect

that most Agreements with assurances and associated enhancement of survival permits will result in minor or negligible effects on the environment including federally listed species and their habitats. Complex, large-scale, or programmatic Agreements and their associated permits will require individual NEPA analysis.

*Issue 17.* Many commenters were confused by the term "umbrella agreements" in the draft policy.

*Response 17.* The Services may enter into an "umbrella" or programmatic Agreement with an appropriate State or local agency or other entity, and through such an Agreement and associated enhancement of survival permit, specify the assurances and take allowances that could be further delegated by the State or local agency or other entity to individual participating non-Federal property owners. In such a case, the State or local agency or other entity would be the permittee and would issue Certificates of Inclusion (also sometimes called Participation Certificates) to non-Federal property owners who satisfy the terms and conditions of the State or local agency's or other entity's "umbrella" or programmatic Agreement and associated permit. To avoid confusion in this final policy, the term "Agreements with non-Federal property owners" is used to refer to Agreements between the Services and individual property owners as well as "umbrella" or programmatic Agreements with State or local agencies or other entities through which assurances are further delegated to individual participating non-Federal property owners.

*Issue 18.* The statement "These assurances will only be provided to the participating property owners or State or local land management agencies but not to State regulatory agencies" confused many commenters who recognized that many State or local land management agencies also have regulatory responsibilities.

*Response 18.* The Services agree that this statement was confusing and have clarified it in the final policy. In making the statement, the Services overlooked the dual role of many State and local land management agencies. The Services intended to emphasize that only non-Federal property owners, whether they are State or local agencies, private individuals, Tribes, or other non-Federal entities, can receive assurances. However, as discussed previously, the Services can enter into an "umbrella" or programmatic Agreement with a State or local agency, including a State or local regulatory agency if appropriate, or other entity, and through such an Agreement and its

associated enhancement of survival permit, specify the assurances and take allowances that can be delegated by the State or local agency or other entity to individual participating non-Federal property owners through Certificates of Inclusion, Participation Certificates, or other similar vehicles.

*Issue 19.* Many commenters questioned the meaning of, or were confused by, the phrase "similarly situated property owners," which was used in describing the standard to which every Candidate Conservation Agreement with assurances will be held. Some commenters asked what the standard would be if there are no other similarly situated property owners within the range of the species. Some commenters asked what non-similarly situated property owners would be required to do. In addition, some commenters asked what property owners outside the current range of the species would be required to do if expansion of the current range of the species is necessary to preclude or remove any need to list.

*Response 19.* The Services agree that the draft policy did not clearly explain the standard that all Agreements with assurances must meet and have revised the description of the standard in the final policy as follows:

"The Services must determine that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if it is assumed that conservation measures were also to be implemented on other necessary properties, would preclude or remove any need to list the covered species. Other necessary properties are other properties on which conservation measures would have to be implemented in order to preclude or remove any need to list the covered species. The kinds of conservation measures specified in an Agreement with assurances will depend on the types, amounts, and conditions of, and need for, the habitats existing on the property and on other biological factors. Different kinds of conservation measures may benefit different life stages or serve to fulfill different life history requirements of the covered species. The amount of benefit provided by an Agreement with assurances will depend on many factors, particularly the size of the area on which conservation measures are implemented and the degree of conservation benefit possible (e.g., through habitat restoration or reduction of take). For example, an Agreement with assurances

for a property with a small area of severely degraded habitat could be designed to achieve greater benefits than one for a property with a large amount of slightly degraded habitat."

The Services believe this description of the standard more clearly explains the contribution an individual property owner entering into an Agreement with assurances would need to make toward precluding or removing any need to list the covered species. This description addresses the fact that properties differ and that, consequently, different conservation measures could be specified for different properties. In addition, this description takes into account the fact that the Services may need to expand the species' current range in order to preclude or remove any need to list.

*Issue 20.* Several commenters asked for clarification of the phrase "species which will likely become candidates in the near future."

*Response 20.* The objective of this policy is to provide incentives to encourage non-Federal property owners to implement early conservation for declining species with the goal of precluding or removing any need to list. The Services did not want to exclude those species that are declining and/or are becoming subject to increasing threats and may soon be considered for candidate status. Including these species is particularly important considering that the rates of decline can sometimes increase abruptly, that the development of a Candidate Conservation Agreement with assurances might take longer than expected, and that conservation options may be more numerous the earlier a species is addressed. Because the circumstances surrounding each species are unique, the Services have chosen not to adopt a strict regulatory definition of the term "species that will likely become candidates in the near future." Instead, the Services will review species that are not candidates or proposed species on a case-by-case basis when determining whether they may be covered by an Agreement with assurances.

*Issue 21.* Several commenters were confused by the phrase "above those levels agreed upon and specified in the Agreement," which was used in describing the assurances provided through Candidate Conservation Agreements with assurances and associated enhancement of survival permits.

*Response 21.* The Services agree that this phrase is confusing and have clarified the meaning in the final policy. The draft policy stated that "\* \* \* take

authorization would be provided to allow the property owner or State or local land management agency to implement management activities that may result in take of individuals or modification of habitat above those levels agreed upon and described in the Agreement." The Services did not intend this statement to mean that the amount of take authorized by an enhancement of survival permit could exceed the amount specified in the associated Agreement or could allow for more habitat modification than specified in the Agreement. Rather, the statement was an attempt to explain that the enhancement of survival permit accompanying an Agreement with assurances would authorize a property owner who exceeds the conservation goal specified in the Agreement (e.g., through additional habitat improvement or the implementation of conservation measures that are more effective or beneficial than anticipated and described in the Agreement) to take the additional or enhanced number of individuals of the species that is consistent with the conservation goal specified in the Agreement. That is, a property owner can still avoid the imposition of additional restrictions above those agreed to in the Agreement where the property owner surpassed the conservation goals established under the Agreement.

*Issue 22.* Some commenters were confused by Part 3A of the draft policy that stated that a Candidate Conservation Agreement with assurances will identify habitat characteristics that support use by the covered species on lands or waters under the property owner's control or that support populations of the covered species in waters that may not be under the property owner's control. These commenters questioned the meaning of the phrase "waters that may not be under the property owner's control."

*Response 22.* In using this phrase, the Services intended to address the fact that, in some cases, characteristics of a particular property owner's property may sustain (or land, water, or resource uses on that property may affect) individuals of a species located on other lands or waters adjacent to or some distance away from the property owner's property. For example, riparian habitat enhancement measures upstream may benefit candidate species that are downstream from the participating property owner's property. An Agreement with assurances can describe this relationship and can include conservation measures to improve the characteristics of the property that help sustain (or to reduce



the impacts of the land, water, or resource uses that may affect) the individuals of the species found off the property owner's property.

*Issue 23.* Several commenters asked if there was any difference between the meanings of the terms "conservation actions," "management actions," "conservation activities," "management activities," and "conservation management activities."

*Response 23.* The Services did not intend for these terms to have different meanings and, in the final policy, have used a single term, "conservation measures," in place of the terms listed above. The term "conservation measures" clearly describes the range of practices which could be included in a Candidate Conservation Agreement with assurances. Not all conservation measures involve "management" that is continued into the future; conservation measures may include removal of a hazard to the species, construction of a habitat feature (such as placement of boulders in a stream to create fish resting habitat), or other practices.

*Issue 24.* Several commenters were confused by the sentence in the "Definitions" section of the draft policy under "Covered species" that read "Those species covered in the Agreement must be treated as if they were listed."

*Response 24.* The Services agree that this sentence may have caused some confusion and the sentence has been deleted from the final policy. The Services have also clarified the definition in the final policy.

*Issue 25.* Some commenters questioned why the Services used the term "incidental take" to describe take authorized by an enhancement of survival permit under section 10(a)(1)(A) of the Act when "incidental take" normally applies to take authorized by an Incidental Take permit under section 10(a)(1)(B).

*Response 25.* The Services have decided to use the term "incidental take" to refer to the take authorized by an enhancement of survival permit associated with a Candidate Conservation Agreement with assurances because this "take" is incidental to enhancing the survival of the species through compliance with the Agreement. Similarly, take resulting from research authorized by an enhancement of survival permit under section 10(a)(1)(A) is "incidental take" in that it is typically a consequence of and not the purpose of the research. The Services believe using the term "incidental take" in this policy will be less confusing than coining a new term to differentiate take authorized under

section 10(a)(1)(A) from that authorized under section 10(a)(1)(B).

*Issue 26.* Some commenters questioned the use of the term "net benefit" in the draft policy.

*Response 26.* The term "net benefit" was erroneously included in the draft policy and has been eliminated in the final policy. "Net benefit" is a concept more appropriately used in "Safe Harbor" Agreements for listed species conservation.

#### Revisions to the Proposed Policy

The following represents a summary of the revisions made to the proposed Candidate Conservation Agreements with Assurances policy following consideration of public comments.

(1) The final policy describes the mechanism for property owners to terminate their voluntary Candidate Conservation Agreements with assurances before the expiration date.

(2) Specific public review periods for proposed Candidate Conservation Agreements with assurances and their associated proposed enhancement of survival permits have been established in the final policy and implementing regulations.

(3) The final policy includes general guidelines for the development of monitoring provisions of Candidate Conservation Agreements with assurances.

(4) Several definitions and terms have been clarified in the final policy.

#### Final Candidate Conservation Agreements With Assurances Policy

##### *Part 1. What Is the Purpose of the Policy?*

This policy, is intended to facilitate the conservation of proposed and candidate species, and species likely to become candidates or proposed in the near future, by giving non-Federal citizens, States, local governments, Tribes, businesses, organizations, and other non-Federal property owners incentives to implement conservation measures for declining species by providing regulatory certainty with regard to land, water, or resource use restrictions that might otherwise apply should the species later become listed as threatened or endangered under the Act. Under the policy, non-Federal property owners who commit in a Candidate Conservation Agreement with assurances to implement mutually agreed upon conservation measures for a proposed or candidate species, or a species likely to become a candidate or proposed in the near future, will receive assurances from the Services that additional conservation measures above

and beyond those contained in the Agreement will not be required, and that additional land, water, or resource use restrictions will not be imposed upon them should the species become listed in the future.

In determining whether to enter into a Candidate Conservation Agreement with assurances, the Services will consider the extent to which the Agreement reduces threats to proposed and candidate species and species likely to become candidates or proposed in the near future so as to preclude or remove any need to list these species as threatened or endangered under the Act. While the Services realize that the actions of a single property owner usually will not preclude or remove any need to list a species, they also realize the collective effect of the actions of many property owners may be to preclude or remove any need to list. Accordingly, the Services will enter into an Agreement with assurances when they determine that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if it is assumed that conservation measures were also to be implemented on other necessary properties, would preclude or remove any need to list the covered species.

While some property owners are willing to manage their lands to benefit proposed and candidate species, or species likely to become candidates or proposed in the near future, most desire some degree of regulatory certainty and assurances with regard to possible future land, water, or resource use restrictions that may be imposed if the species is listed in the future. The Services will provide regulatory certainty to a non-Federal property owner who enters into a Candidate Conservation Agreement with assurances by authorizing, through issuance of an enhancement of survival permit under section 10(a)(1)(A) of the Act, a specified level of incidental take of the species covered in the Agreement. Incidental take authorization benefits non-Federal property owners in two ways. First, incidental take authorization provides assurances to property owners that any extra, either intentional or unintentional, benefits they achieve for the species beyond those agreed upon will not result in additional land, water, or resource use restrictions that would otherwise be imposed should the species become listed in the future. Second, in the event the species is listed in the future, incidental take authorization enables

property owners to continue current land uses that have traditionally caused take, provided take is at or reduced to a level consistent with the overall goal of precluding or removing any need to list the species.

Candidate Conservation Agreements with assurances will be developed in close coordination and cooperation with the appropriate State fish and wildlife agencies and other affected State agencies and Tribes, as appropriate. Close coordination with State fish and wildlife agencies is particularly important given their primary responsibilities and authorities for the management of unlisted resident species. Agreements with assurances are to be consistent with applicable State laws and regulations governing the management of these species.

The Services must determine that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if it assumed that conservation measures were also to be implemented on other necessary properties, would preclude or remove any need to list the covered species. Pursuant to section 7 of the Act, the Services must also ensure that the conservation measures included in any Agreement with assurances do not jeopardize any listed or proposed species and do not destroy or adversely modify any proposed or designated critical habitats that may occur in the area.

Some non-Federal property owners may not have the necessary resources or expertise to develop Candidate Conservation Agreements with assurances. Therefore, the Services are committed to providing, to the maximum extent practicable given available resources, the necessary technical assistance to develop Agreements with assurances and prepare enhancement of survival permit applications. Furthermore, the Services may assist or train property owners to implement conservation measures.

Development of a biologically sound Agreement and enhancement of survival permit application are intricately linked. The Services will process the participating non-Federal property owner's enhancement of survival permit application following the procedures described in 50 CFR Parts 17.22(d)(1) and 17.32(d)(1) or 50 CFR Part 222. All terms and conditions of the enhancement of survival permit must be consistent with the conservation measures included in the associated Agreement with assurances.

## *Part 2. What Definitions Apply to this Policy?*

The following definitions apply for the purposes of this policy.

"Candidate Conservation Agreement" means an Agreement signed by either Service, or both Services jointly, and other Federal or State agencies, local governments, Tribes, businesses, organizations, or non-Federal citizens, that identifies specific conservation measures that the participants will voluntarily undertake to conserve the covered species.

"Candidate Conservation Agreements with assurances" means a Candidate Conservation Agreement with a non-Federal property owner that meets the standards described in this policy and provides the non-Federal property owner with the assurances described in this policy.

"Candidate Conservation Assurances" are assurances provided to a non-Federal property owner in a Candidate Conservation Agreement with assurances that conservation measures and land, water, or resource use restrictions in addition to the measures and restrictions described in the Agreement will not be imposed should the covered species become listed in the future. Candidate Conservation Assurances will be authorized by an enhancement of survival permit. Such assurances may apply to a whole parcel of land, or a portion, as identified in the Agreement.

"Candidate species" are defined differently by the Services. FWS defines candidate species as species for which FWS has sufficient information on file relative to status and threats to support issuance of proposed listing rules. NMFS defines candidate species as species for which NMFS has information indicating that listing may be warranted but for which sufficient information to support actual proposed listing rules may be lacking. The term "candidate species" used in this policy refers to those species designated as candidates by either of the Services.

"Conservation measures" are actions that a non-Federal property owner voluntarily agrees to undertake when entering into a Candidate Conservation Agreement with assurances.

"Covered species" means those species that are the subject of a Candidate Conservation Agreement with assurances and associated enhancement of survival permit. Covered species are limited to species that are candidates or proposed for listing and species that are likely to become candidates or proposed in the near future.

"Enhancement of survival permit" means a permit issued under section

10(a)(1)(A) of the Act that, as related to this policy, authorizes the permittee to incidentally take species covered in a Candidate Conservation Agreement with assurances.

"Non-Federal property owner" includes, but is not limited to, States, local governments, Tribes, businesses, organizations, and private individuals, and includes owners of land as well as owners of water or other natural resources.

"Other necessary properties" are properties in addition to the property that is the subject of a Candidate Conservation Agreement with assurances on which conservation measures would have to be implemented in order to preclude or remove any need to list the covered species.

"Proposed species" is a species for which the Services have published a proposed rule to list as threatened or endangered under section 4 of the Act.

## *Part 3. What Are Candidate Conservation Agreements With Assurances?*

Candidate Conservation Agreements with assurances will identify or include:

A. The population levels (if available or determinable) of the covered species existing at the time the parties negotiate the Agreement; the existing habitat characteristics that sustain any current, permanent, or seasonal use by the covered species on lands or waters owned by the participating non-Federal property owner; and/or the existing characteristics of the property owner's lands or waters included in the Agreement that support populations of covered species on lands or waters not on the participating property owner's property;

B. The conservation measures the participating non-Federal property owner is willing to undertake to conserve the species included in the Agreement;

C. The benefits expected to result from the conservation measures described in B above (e.g., increase in population numbers; enhancement, restoration, or preservation of habitat; removal of threat) and the conditions that the participating non-Federal property owner agrees to maintain. The Services must determine that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if it is assumed that conservation measures were also to be implemented on other necessary properties, would



preclude or remove any need to list the covered species;

D. Assurances provided by the Services that no additional conservation measures will be required and no additional land, water, or resource use restrictions will be imposed beyond those described in B above should the covered species be listed in the future. Assurances related to take of the covered species will be authorized by the Services through a section 10(a)(1)(A) enhancement of survival permit (see Part 5);

E. A monitoring provision that may include measuring and reporting progress in implementation of the conservation measures described in B above and changes in habitat conditions and the species' status resulting from these measures; and,

F. A notification requirement to provide the Services or appropriate State agencies with a reasonable opportunity to rescue individuals of the covered species before any authorized incidental take occurs.

#### *Part 4. What Are the Benefits to the Species?*

Before entering into a Candidate Conservation Agreement with assurances, the Services must make a written finding that the benefits of the conservation measures implemented by a property owner under a Candidate Conservation Agreement with assurances, when combined with those benefits that would be achieved if it is assumed that conservation measures were also to be implemented on other necessary properties, would preclude or remove any need to list the covered species. If the Services and the participating property owner cannot agree to an adequate set of conservation measures that satisfy this requirement, the Services will not enter into the Agreement. Expected benefits of the conservation measures could include, but are not limited to: restoration, enhancement, or preservation of habitat; maintenance or increase of population numbers; and reduction or elimination of incidental take.

#### *Part 5. What Are Assurances to Property Owners?*

In a Candidate Conservation Agreement with assurances, the Services will provide that if any species covered by the Agreement is listed, and the Agreement has been implemented in good faith by the participating non-Federal property owner, the Services will not require additional conservation measures nor impose additional land, water, or resource use restrictions beyond those the property owner

voluntarily committed to under the terms of the original Agreement. Assurances involving incidental take will be authorized through issuance of a section 10(a)(1)(A) enhancement of survival permit, which will allow the property owner to take individuals of the covered species so long as the level of take is consistent with those levels agreed upon and identified in the Agreement.

The Services will issue an enhancement of survival permit at the time of entering into the Agreement with assurances. This permit will have a delayed effective date tied to the date of any future listing of the covered species. The Services believe that an enhancement of survival permit is particularly well suited for Candidate Conservation Agreements with assurances because the main purpose of such Agreements is to enhance the survival of declining species.

The Services are prepared as a last resort to revoke a permit implementing a Candidate Conservation Agreement with assurances where continuation of the permitted activity would be likely to result in jeopardy to a species covered by the permit. Prior to taking such a step, however, the Services would first have to exercise all possible means to remedy such a situation.

#### *Part 6. How Do the Services Comply With National Environmental Policy Act?*

The National Environmental Policy Act of 1969 (NEPA), as amended, and the regulations of the Council on Environmental Quality (CEQ) require all Federal agencies to examine the environmental impact of their actions, to analyze a full range of alternatives, and to use public participation in the planning and implementation of their actions. The purpose of the NEPA process is to help Federal agencies make better decisions and to ensure that those decisions are based on an understanding of environmental consequences. Federal agencies can satisfy NEPA requirements either by preparing an Environmental Assessment (EA) or Environmental Impact Statement (EIS) or by showing that the proposed action is categorically excluded from individual NEPA analysis.

The Services will review each Candidate Conservation Agreement with assurances and associated enhancement of survival permit application for other significant environmental, economic, social, historical or cultural impact, or for significant controversy (516 DM 2, Appendix 2 for FWS and NOAA's Environmental Review Procedures and NOAA Administrative Order Series

216-6). If the Services determine that the Agreement and permit will likely result in any of the above effects, preparation of an EA or EIS will be required. General guidance on when the Services exclude an action categorically and when and how to prepare an EA or EIS is found in the FWS's Administrative Manual (30 AM 3) and NOAA Administrative Order Series 216-6.

The Services expect that most Candidate Conservation Agreements with assurances and associated enhancement of survival permits will result in minor or negligible effects on the environment and will be categorically excluded from individual NEPA analysis. When the impacts to the environment are expected to be more than minor, individual NEPA analysis will be required. Complex, large-scale, or programmatic Agreements and their associated permits will typically be subject to individual NEPA analysis.

#### *Part 7. Will There Be Public Review?*

Public participation in the development of a proposed Candidate Conservation Agreement with assurances will only be provided when agreed to by the participating property owner. However, the Services will make every proposed Agreement available for public review and comment as part of the public evaluation process that is statutorily required for issuance of the enhancement of survival permit associated with the Agreement. This comment period will generally be 30 days but may be longer for very large or programmatic Agreements. The public will also be given other opportunities to review Agreements in certain cases. For example, when the Services receive an Agreement covering a proposed species, and when the Services determine, based upon a preliminary evaluation, that the Agreement could potentially justify withdrawal of the proposed rule, the comment period for the proposed rule will be extended or reopened to allow for public comments on the Agreement's adequacy in removing or reducing threats to the species. However, the Act requires the Services to issue a final determination within 1 year of issuing a proposed rule to list; the Services will not extend this time frame in order to allow for the completion and/or consideration of an Agreement with assurances. Therefore, the Services may not be able to consider in their final determination Agreements that are not received within a reasonable period of time after issuance of the proposed rule.

***Part 8. Do Property Owners Retain Their Discretion?***

Nothing in this policy prevents a participating property owner from implementing conservation measures not described in the Agreement, provided such measures are consistent with the conservation measures and conservation goal described in the Agreement. The Services will provide technical advice, to the maximum extent practicable, to the property owner when requested. Additionally, a participating property owner, with good cause, can terminate the Agreement prior to its expiration date, even if the terms and conditions of the Agreement have not been realized. However, the enhancement of survival permit would also be terminated at the same time.

***Part 9. What Is the Discretion of All Parties?***

Nothing in this policy compels any party to enter a Candidate Conservation Agreement with assurances at any time. Entering an Agreement is voluntary for non-Federal property owners and the Services. Unless specifically noted, an Agreement does not otherwise create or waive any legal rights of any party to the Agreement.

***Part 10. Can Agreements Be Transferred?***

If a property owner who is a party to a Candidate Conservation Agreement with assurances transfers ownership of the enrolled property, the Services will regard the new property owner as having the same rights and obligations as the original property owner if the new property owner agrees to become a party to the original Agreement. Actions taken by the new participating property owner that result in the incidental take of species covered by the Agreement would be authorized if the new property

owner maintains the terms and conditions of the original Agreement. If the new property owner does not become a party to the Agreement, the new owner would neither incur responsibilities under the Agreement nor receive any assurances relative to section 9 restrictions resulting from listing of the covered species.

An Agreement must commit the participating property owner to notify the Services of any transfer of ownership at the time of the transfer of any property subject to the Agreement. This will allow the Services the opportunity to contact the new property owner to explain the prior Agreement and to determine whether the new property owner would like to continue the original Agreement or enter a new Agreement. When a new property owner continues an existing Agreement, the Services will honor the terms and conditions of the original Agreement.

***Part 11. Is Monitoring Required?***

The Services will ensure that necessary monitoring provisions are included in Candidate Conservation Agreements with assurances and associated enhancement of survival permits. Monitoring is necessary to ensure that the conservation measures specified in an Agreement and permit are being implemented and to learn about the effectiveness of the agreed upon conservation measures. In particular, when adaptive management principles are included in an Agreement, monitoring is especially helpful for obtaining the information needed to measure the effectiveness of the conservation program and detect changes in conditions. However, the level of effort and expense required for monitoring can vary substantially among Agreements depending on the circumstances. For many Agreements,

monitoring can be conducted by the Services or a State agency and may involve only a brief site inspection and appropriate documentation.

Large-scale or complex Candidate Conservation Agreements with assurances may require more in-depth and comprehensive monitoring. Monitoring programs must be agreed upon and included in the Agreement prior to public review and comment on the Agreement. The Services are committed to providing as much technical assistance as possible in the development of acceptable monitoring programs. Additionally, these monitoring programs will provide valuable information that the Services can use to evaluate program implementation and success.

***Part 12. How Are Cooperation and Coordination With the States and Tribes Described in the Policy?***

Coordination between the Services, the appropriate State fish and wildlife agencies, affected Tribal governments, and property owners is important to the successful development and implementation of Candidate Conservation Agreements. The Services will closely coordinate and consult with the affected State fish and wildlife agency and any affected Tribal government that has a treaty right to any fish or wildlife resources covered by an Agreement.

Dated: March 22, 1999.

**Jamie Rappaport Clark,**  
Director, U.S. Fish and Wildlife Service.

Dated: June 10, 1999.

**Penelope D. Dalton,**  
Assistant Administrator for Fisheries,  
National Marine Fisheries Service.  
[FR Doc. 99-15257 Filed 6-11-99; 5:08 pm]  
BILLING CODE 4310-55-P

## **EXHIBIT B**



# FINDING OF NO SIGNIFICANT IMPACT

## **Approval of Umbrella Candidate Conservation Agreement with Assurances for Fluvial Arctic Grayling in Upper Big Hole River, Montana, between Montana Fish, Wildlife & Parks and U.S. Fish & Wildlife Service**

Montana Fish, Wildlife and Parks (MFWP) submitted an application for an Endangered Species Act (ESA) section 10(a)(1)(A) Enhancement of Survival Permit (Permit) to the U.S. Fish and Wildlife Service (Service) on April 1, 2005. The requested Permit is associated with an Umbrella Candidate Conservation Agreement with Assurances (CCAA) for fluvial Arctic grayling (*Thymallus arcticus*) in the upper Big Hole River watershed, southwestern Montana. The Permit potentially covers land and water use and conservation activities across more than 380,000 acres of non-Federal lands in the upper Big Hole River watershed. The umbrella CCAA includes most of the non-Federal properties adjacent to occupied and historic fluvial Arctic grayling habitat in the Big Hole River upstream from where Montana Highway 43 crosses the Big Hole River at Dickie Bridge.

The CCAA is intended to benefit fluvial Arctic grayling by reducing habitat-related threats to the species through the collaborative implementation of conservation measures and modification of existing land and water use activities in the project area. The CCAA is intended to be implemented as a collaborative effort between non-Federal landowners and the participating agencies (MFWP, Montana Department of Natural Resources and Conservation, USDA Natural Resources Conservation Service, and the Service). Participating landowners receive regulatory certainty concerning land and water use restrictions that might otherwise apply if the fluvial Arctic grayling were federally listed under the ESA.

The Service has analyzed three alternatives – the No Action Alternative, the Proposed Action Alternative, and a limited umbrella CCAA Alternative. Under the No Action Alternative, the CCAA would not be approved and the Permit would not be issued to MFWP. Under the Proposed Action Alternative, the umbrella CCAA covering 380,000 non-Federal acres in the upper Big Hole River watershed would be approved and the Permit issued to MFWP. Non-Federal property owners would participate in the CCAA through implementation of an MFWP-approved and Service-approved site-specific plan that describes how land and water management practices on enrolled properties will be undertaken to benefit fluvial Arctic grayling. Landowners implementing these site-specific plans will hold a valid Certificate of Inclusion that indicates official participation in the CCAA. Under the limited umbrella CCAA Alternative, an umbrella CCAA would be implemented as in the Proposed Action, except that the project area will be “limited” to an area of 130,000 acres in the upper watershed in the vicinity of Wisdom, Montana. This “limited” area includes a segment of the Big Hole River considered a restoration priority for grayling.

In addition to the three alternatives formally analyzed above, four alternatives were eliminated from formal consideration as being impractical for logistical reasons or too similar to one of the analyzed alternatives.



The attached final Environmental Assessment that analyzed the three alternatives was prepared as a joint document between the Service and MFWP. The MFWP, as the Permit applicant, has an obligation to analyze the effects of implementing the CCAA under the Montana Environmental Protection Act. The effects of the action were jointly analyzed, but the final agency decisions resulting from this analysis are reached independently by the MFWP and the Service and issued as separate documents (e.g., Finding of No Significant Impact by the Service, Decision Notice by MFWP).

The Proposed Action Alternative (umbrella CCAA) was selected over the No Action Alternative and the limited umbrella CCAA because the Service has found that--1) the taking of fluvial Arctic grayling that is incidental would be lawful and in accordance with the terms of the CCAA; 2) the CCAA complies with the requirements of the CCAA policy; 3) the probable direct and indirect effects of any authorized take would not appreciably reduce the likelihood of survival and recovery in the wild of any species; 4) implementation of the terms of the CCAA and Permit is consistent with applicable Federal, State, and tribal laws and regulations; 5) implementation of the terms of the CCAA and Permit would not be in conflict with any ongoing conservation programs for the species covered by the Permit; and 6) the MFWP and collaborating agencies have shown capability for and commitment to implementing all of the terms of the CCAA and Permit.

The umbrella CCAA is expected to result in benefits to fluvial Arctic grayling because it provides --1) a framework for the development and implementation of conservation measures and site-specific plans to benefit grayling which involves the coordinated efforts of State and Federal agencies with expertise in fishery biology and management; wildlife biology; hydrology; and all aspects of agricultural, irrigation, and grazing management; 2) implementation of conservation measures to reduce habitat-related threats to grayling by increasing instream flows, conserving and restoring riparian habitats, removing barriers to migration, and reducing population-level effects of entrainment; and 3) an incentive for non-Federal landowner support of grayling conservation efforts through the regulatory certainty and incidental take exemption provided by the CCAA, Permit, and Certificates of Inclusion.

Some adverse effects to grayling may occur from incidental take caused by permitted or covered activities by non-Federal landowners and the participating State and Federal agencies. Adverse effects to grayling from the CCAA include--(a) activities relating to land and water use (i.e., irrigation of hay, pasture; livestock grazing; and livestock watering) that are permitted under the CCAA but reduced from past and current levels, and (b) restoration and monitoring activities required by the CCAA that may cause some disturbance and harm to individual grayling or habitat, but are necessary to benefit the species. This take resulting from approval of the CCAA and issuance of the Permit has been addressed and accounted for in the Service's Conference Opinion. The conservation benefits of the CCAA appear to outweigh any adverse effects, and the CCAA is designed to produce an increase in the abundance and distribution of the species.

The proposal is not expected to have any significant effects on the human environment.

Natural hydrologic function would be improved in the project area as less water is diverted from the natural river channel.

No impact or positive effects are anticipated for native vegetation. In particular, the CCAA should conserve existing riparian habitats and restore those that are currently degraded. Some impacts to existing agricultural vegetation may occur where habitat restoration or changes in land or water uses are required in order to benefit grayling.

No significant impacts to natural wetlands are expected, but some incidental wetlands sustained by existing over-irrigation may be affected through implementation of measures intended to increase irrigation efficiency resulting in a reduction in the amount of water diverted from the natural stream channel.

Effects to grayling and other coldwater fishes should be largely positive from aquatic habitat improvements that result from increased instream flows, more natural hydrologic function, restored riparian zones, improved fish passage, and a reduction in entrainment in irrigation ditches.

No significant impact is expected for resident wildlife species, but species using riparian habitats are likely to benefit from improved conditions that should result under the CCAA.

The Service's biological evaluation has found there are expected to be no adverse impacts to any endangered, threatened or candidate species as a result of the CCAA.

Any ground-disturbing activities required to implement the CCAA would require a site-specific analysis from the State or Federal agency (e.g., under the Montana Environmental Protection Act, National Environmental Protection Act, or National Historic Preservation Act) leading or coordinating the specific project as well as possible consultation with the Montana State Historical Preservation Office, to ensure no significant impacts to cultural and historical resources in the project area.

The proposal is not expected to have any significant adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988.

Fishing and hunting are the two primary recreational activities occurring within the proposed project area. Recreational fishing opportunities should increase from improved physical habitat conditions for fishes over a large segment of river and should benefit nonnative sport fishes in addition to helping grayling. The overall effect of the CCAA on hunting should be negligible or positive. Non-Federal lands in the proposed project area would remain in agricultural production, so little or no change from current population levels is anticipated for many game species. Beneficial effects would be most evident where game species respond positively to riparian habitat conservation and restoration.

The land and water-use practices to be implemented under the CCAA are expected to result in economically and ecologically sustainable ranching operations in the project area, so no long-term economic or social impacts for the local community are anticipated. Capital or labor

expenses needed to implement conservation measures would be covered, to the extent possible, by State and Federal funding programs, so no economic hardship is expected. Overall, the CCAA might maintain or increase the stability of local communities and their economies because participating landowners would have regulatory certainty that their land and water use activities would not be curtailed further if fluvial Arctic grayling were listed under the ESA.

The CCAA has been coordinated with all interested and/or affected parties. A draft CCAA, Permit application, and draft Environmental Assessment were made available to all interested and/or affected parties on November 23, 2005, for a 60-day public comment period. Several comments were received on the documents, but addressed primarily the content of the CCAA rather than the draft Environmental Assessment. These public comments were responded to in our Findings document. No changes to the draft Environmental Assessment were necessary.

Based on a review and evaluation of the information contained in the Environmental Assessment, it is my determination that the Proposed Alternative, the umbrella CCAA with the MFWP, does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. The Environmental Assessment prepared in support of this finding follows this decision.

  
Deputy Regional Director, Region 6

6/1/06  
Date

UNITED STATES FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the action of (describe action):

Check One:

- ☐ is a categorical exclusion as provided by 51 6 DM 2, Appendix I and 516 DM 6, Appendix 1. No further NEPA documentation will therefore be made.
- ☒ is found not to have significant environmental effects as determined by the attached environmental assessment and finding of no significant impact.
- ☐ is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.
- ☐ is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, policy, regulations, or procedures.
- ☐ is an emergency action within the context of 40 CFR 1506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting documents (list):

Signature Approval:

<u>R. Mark Wilson</u>	<u>5/15/06</u>	<u>Lauren R. Paula</u>	<u>6/1/06</u>
(1) Originator	Date	(2) WO/RO Environmental Coordinator	Date
<u>Mike Stempel</u>	<u>6/1/06</u>	<u>Elliott Settle</u>	<u>6/1/06</u>
(3) AD/ARD	Date	(4) Director/Regional Director	Date



## **EXHIBIT C**

# **FINAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT**

**for**

**Candidate Conservation Agreement with Assurances  
and Associated Permit for Fluvial Arctic Grayling  
in the Upper Big Hole River, Montana**

**Prepared by:**

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**May 2006**

# TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	iii
ALTERNATIVES ANALYZED IN THIS ENVIRONMENTAL ASSESSMENT .....	iv
I. PURPOSE AND NEED FOR TAKING ACTION .....	6
A. Introduction.....	6
B. Purposed and Need.....	6
C. Decision to be Made by the Responsible Official.....	8
D. Issues Raised During Planning .....	13
II. ALTERNATIVES INCLUDING THE PROPOSED ACTION .....	15
A. Alternative A – NO ACTION .....	15
B. Alternative B – PROPOSED ACTION.....	16
C. Alternative C – LIMITED UMBRELLA AGREEMENT .....	19
D. Alternatives Eliminated From Consideration .....	20
III. AFFECTED ENVIRONMENT .....	24
A. Introduction.....	24
B. Ecology of Fluvial Arctic Grayling.....	26
C. Hydrology.....	30
D. Vegetation .....	32
E. Wetlands .....	34
F. Fisheries .....	35
G. Wildlife .....	38
H. Social Considerations.....	39
IV. ENVIRONMENTAL CONSEQUENCES .....	45
A. General Differences Among the Alternatives.....	45
B. Fluvial Arctic Grayling .....	46
C. Hydrology.....	52
D. Vegetation .....	54
E. Wetlands .....	56
F. Fisheries .....	58
G. Wildlife .....	62
H. Social and Economic Considerations.....	64
I. Consideration of Changed Circumstances and Adaptive Management Provisions Under the Proposed Action.....	72
V. CUMULATIVE EFFECTS .....	77
A. Fluvial Arctic Grayling and Other Fish Populations .....	77
B. Hydrology .....	79
C. Vegetation .....	80
D. Wetlands.....	80
E. Wildlife .....	80
F. Social and Economic Considerations .....	81
G. Federal Lands .....	82
H. Other Parameters.....	88
VI. COMPLIANCE, CONSULTATION, AND COORDINATION WITH OTHERS.....	88
A. National Environmental Policy Act Coordination and Environmental Evaluation Conducted by the Agencies.....	88
B. Environmental Justice.....	90
C. Public Review and Comment.....	90
VII. REFERENCES.....	91
VIII. LIST OF APPENDICES.....	97

## EXECUTIVE SUMMARY

The purpose of this Environmental Assessment (EA) is to satisfy the National Environmental Policy Act (NEPA) and Montana Environmental Policy Act (MEPA) requirements for a proposed action to implement a 20-year umbrella Candidate Conservation Agreement with Assurances (CCAA/Agreement) with Montana Fish, Wildlife and Parks (MFWP) (Appendix 1). Through the NEPA process the U.S. Fish and Wildlife Service (USFWS) will decide whether to issue MFWP a section 10(a)(1)(b) Enhancement of Survival permit (Permit). The MFWP will decide through MEPA analysis whether to implement the Agreement. The Agreement has been prepared by MFWP, with assistance from USDA Natural Resources and Conservation Service (NRCS), Montana Department of Natural Resources and Conservation (MDNRC), and the USFWS. The purpose of the Agreement is to promote conservation of Arctic grayling (*Thymallus arcticus*) in the upper Big Hole River in southwestern Montana. Two other alternatives are compared to the proposed action to assess whether the action causes significant effects to the human environment in the project area.

The majority of present and historic fluvial Arctic grayling habitat is located adjacent to non-Federal lands. Therefore, the survival and recovery of the species is closely associated with the current and future land and water uses occurring on the non-Federal lands. The potential for an Endangered Species Act (ESA) listing of fluvial Arctic grayling, which would have economic, legal, and social repercussions for affected individuals; and the large spatial scale at which habitat must be protected and restored has highlighted the need for a more comprehensive, collaborative, and long-term approach to fluvial Arctic grayling conservation in the Big Hole River. Therefore, there is an obvious need to secure the cooperation of those non-Federal landowners in the Big Hole River watershed who reside within the range of the species to promote the implementation of land uses that would be beneficial to the fluvial Arctic grayling.

The umbrella Agreement describes specific land and water-use activities and conservation practices that would be implemented to benefit the species on the non-Federal lands. In exchange for volunteering to implement beneficial practices for fluvial Arctic grayling, the participating landowners would be granted authorization to incidentally 'take' fluvial Arctic grayling under a Permit issued pursuant to section 10(a)(1)(A) of the ESA, and by receiving assurances that they would not incur additional land-use restrictions if the species is listed under the ESA. The Permit would become effective if the fluvial Arctic grayling was subsequently federally listed, and would then authorize a level of 'take' for each enrolled landowner. Thus, an operational conservation program would be in place that would improve the species status, and the participating non-Federal landowners would benefit by receiving take authorization and assurances that they can continue with agreed upon land and water uses.

The Agreement is consistent with the USFWS' "Candidate Conservation Agreement with Assurances Final Policy" (64 FR 32726). This policy encourages the implementation of conservation measures for species that have not been listed under the ESA, but warrant agency concern. The Agreement identifies obligations of the parties, including participating landowners. Approval of the Agreement would provide conservation benefits for fluvial Arctic grayling on non-federally owned lands in Beaverhead and Deerlodge Counties, Montana.



Fluvial Arctic grayling have declined throughout their historic range. Fluvial Arctic grayling currently occupy only a fraction (~5%) of their historic range within the Missouri River watershed upstream of the Great Falls (Figures 2 and 3). Kaya (1992a) concluded that the major factors causing the range-wide decline of fluvial Arctic grayling in the upper Missouri River system include habitat degradation, angling exploitation and overfishing, and interactions with introduced nonnative salmonid fishes. Fluvial Arctic grayling in Montana are presently restricted to an approximately 80-mile long segment of the upper Big Hole River. Historical and contemporary land use in the Big Hole Valley has led to habitat degradation, fragmentation, and loss. Specifically, irrigation diversions have reduced streamflows and may block migratory pathways, and uncontrolled livestock grazing has severely impacted streamside (riparian) habitats. Collectively, these circumstances have led to stream dewatering, elevated summer water temperatures, channel alterations and habitat simplification, and the reduced the ability of fluvial Arctic grayling to access necessary habitats. In addition, fluvial Arctic grayling may be accidentally entrained (captured) in irrigation ditches. Brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) are three species of nonnative trout that have established populations in the system and may threaten fluvial Arctic grayling through competition and predation.

The MFWP has been committed to the protection and restoration of fluvial Arctic grayling throughout its historic range in Montana. In 1996, MFWP signed a Memorandum of Agreement (MOA) with the USFWS (MFWP and USFWS 1996) that recognizes the Montana Fluvial Arctic Grayling Restoration Plan (Restoration Plan) (MFWP 1995) as the conservation strategy to guide restoration and management of fluvial Arctic grayling in the upper Missouri River. The Restoration Plan was developed by the Montana Fluvial Arctic Grayling Workgroup (Workgroup), an interagency committee established in the 1980s to provide guidance on fluvial Arctic grayling restoration, research, and management. The Restoration Plan's general restoration approach is to: a) reestablish four additional fluvial Arctic grayling populations in historic waters, and b) secure and expand the existing population in the Big Hole River. The MFWP, in collaboration with other agencies, has been implementing the MOA and Restoration Plan provisions in good faith. For the past decade, MFWP and USFWS' Partners for Fish and Wildlife (Partners) program have engaged Big Hole River valley landowners in small-scale restoration projects to benefit fluvial Arctic grayling. In both 2004 and 2005, the NRCS has utilized special initiative Environmental Quality and Incentives (EQIP) programs to provide technical and financial assistance to producers willing to implement both short- and long-term practices to improve habitat conditions for fluvial Arctic grayling in the Big Hole River.

## **ALTERNATIVES ANALYZED IN THIS ENVIRONMENTAL ASSESSMENT**

**Alternative A - No Action Alternative** - An Agreement would not be developed, a Permit would not be issued, and landowners would not receive any future incidental take authorization or assurances for future management of their lands should Federal listing occur. Some beneficial conservation measures identified in the Restoration Plan may be implemented under this alternative, MFWP and USFWS Partners program would continue to collaborate on conservation of fluvial Arctic grayling. Watershed groups or other interested parties also may implement habitat conservation projects. The NRCS may continue with EQIP or other programs depending

on agency funding and producer interest. However, these individual actions may not be coordinated in a large-scale restoration effort and the landowners would not receive regulatory assurances for their participation.

**Alternative B - Proposed Action (Preferred) Alternative** - An Agreement would be developed, and a Permit would be issued to MFWP. The Project Area would cover approximately 380,000 acres in the upper Big Hole River watershed. Participating landowners would sign up under the Agreement, be issued a Certificate of Inclusion (CI) and be covered by the Permit. The conservation goal of the Agreement is to secure and enhance populations of fluvial Arctic grayling within the historic range of the species in the upper reaches of the Big Hole River drainage. The conservation guidelines of the Agreement would be met by implementing conservation measures that:

- 1) Improve streamflows
- 2) Improve and protect the function of riparian habitats
- 3) Identify and reduce or eliminate entrainment threats for fluvial Arctic grayling
- 4) Remove barriers to fluvial Arctic grayling migration

Conservation measures on non-Federal lands would be implemented by the participating landowner or cooperating agencies, and the landowner would receive a level of incidental 'take' coverage and assurances that no further conservation measures would be required if Federal listing occurs. These activities would include farming and ranching related activities such as hay production and livestock grazing, and supporting activities such as diversion of irrigation water and operation of farm equipment.

**Alternative C – Limited Umbrella Agreement** – A “limited” umbrella Agreement would be implemented in only a portion of the Project Area described in Alternative B. The area would correspond generally to the portion of the upper Big Hole River watershed characterized as Management Segment C in the Agreement and would include approximately 130,000 acres of non-Federal lands in the vicinity of Wisdom, Montana. The Agencies generally consider restoration of this section of the river a priority.

## **I. PURPOSE AND NEED FOR TAKING ACTION**

### **A. Introduction**

This EA is being prepared to address the impacts of (1) issuing an ESA section 10(a)(1)(A) Permit to MFWP and execution of an umbrella Agreement (Appendix 1) for the fluvial Arctic grayling (*Thymallus arcticus*) in the upper Big Hole River, Montana, and (2) implementation of the Agreement for the fluvial Arctic grayling (*Thymallus arcticus*) in the upper Big Hole River, Montana, by MFWP. The USFWS received the completed Permit application on April 5, 2005. The Permit application was updated on August 22, 2005, to include an expanded and revised version of the Agreement. Issuance of the Permit and execution of the Agreement are Federal actions subject to the NEPA (42 U.S.C. §4321 et. seq.). The MFWP's decision to implement the Agreement is subject to the MEPA (MEPA, 75-1-101, Montana Codes Annotated, et seq.).

The purpose of this EA is to determine whether there will be significant impacts to the human environment as a result of the proposed action or its alternatives (NEPA, 42 U.S.C. §4321 et. seq.). If there were a finding of significant impact then an environmental impact statement would be prepared. If a determination were made that there are no significant impacts then a Finding of No Significant Impacts (FONSI) would be issued by the USFWS. The EA presents an analysis of the impacts of implementing the proposed action and alternatives to the physical and human environment. A summary of this analysis appears in Table 13.

The enrollment of Participating Landowners into the Agreement and Participating Landowners' continued participation in the Agreement are strictly voluntary actions taken by the Participating Landowners. Site-specific plans that describe the conservation measures to be implemented on enrolled properties are developed cooperatively with and must be approved by Participating Landowners. Therefore, the proposed action and alternatives do not regulate the use of private property. Actually, the proposed action can protect landowners participating in the Agreement from future ESA regulatory actions. By participating in the Agreement, landowners receive assurances that land use restrictions additional to those described and agreed to in site-specific plans would not be required should the fluvial Arctic grayling be listed under the ESA.

The Agreement has been prepared by MFWP, with assistance from NRCS, MDNRC, and USFWS. Under the Agreement, MFWP would hold the Permit and issue individual CIs to non-Federal property owners who implement conservation measures to benefit fluvial Arctic grayling. In return, these property owners receive regulatory assurances that should fluvial Arctic grayling be listed under the ESA, they would be exempted from a specified level of incidental take and not be required to implement conservation actions beyond those specified in the Agreement. The cooperating agencies NRCS and MDNRC also are expected to sign the Agreement as a commitment to provide technical expertise and funding to implement the provisions of the Agreement.

## **(1) Montana Environmental Protection Act Process**

This document also will satisfy MFWP's requirements under MEPA. Any predecisional material contained within this section is to satisfy MEPA and should not be considered pre-decisional under the NEPA process.

In addition to the information provided in Table 13, MEPA also requires the consideration of the following criteria in addition to those required by NEPA for determining the significance of impacts on the human environment:

- a) the severity, duration, geographic extent, and frequency of occurrence of the impact;
- b) the probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;
- c) growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts;
- d) the quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources or values;
- e) the importance to the State and to society of each environmental resource or value that would be affected;
- f) any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and,
- g) potential conflict with local, State, or Federal laws, requirements, or formal plans.

Table 14 summarizes the review of these MEPA significance criteria for each of the 10 environmental parameters addressed in the EA. Based on this significance determination, MFWP has concluded there are no significant negative impacts from the proposed action. Additionally, MFWP has concluded that no mitigation or stipulations are required to keep the negative impacts below the level of significance. The MFWP has determined that there are no secondary impacts to the physical or human environment from the proposed action or alternatives and that there are no impacts that require mitigation.

In its determination to use an EA or an Environmental Impact Statement (EIS), MEPA requires MFWP to consider whether the proposed action or alternatives require regulatory restrictions on private property. Additional assessment of the impacts to private property is necessary to comply with the Private Property Assessment Act, Chapter 462, Laws of Montana (1995). A Private Property Assessment Act checklist was completed (Appendix 5) and MFWP determined that no taking or damaging implications result from the implementation of the proposed action.



The Agreement does not regulate the use of private tangible personal property or real property under a regulatory statute, does not result in taking or damaging implications to private property, and none of the anticipated impacts to the physical and human environment have been determined to have significant adverse effects.

After public review, USFWS will determine if additional environmental analysis is required pursuant to NEPA or if a FONSI can be made pursuant to the Council on Environmental Quality regulations and applicable guidance. The MEPA requires that an EA include "a finding on the need for an EA and, if appropriate, an explanation of the reasons for preparing the EA. If an EIS is not required, the EA must describe the reasons the EA is an appropriate level of analysis" (Administrative Rules of Montana 12.2.432(3)(j)). Therefore, for the reasons mentioned above, MFWP concludes that an EIS is not required for analysis of the proposed action under MEPA and, further, a sufficient level of analysis is provided by this EA.

## **B. Purpose and Need**

The primary purpose of the proposed Agreement is to allow for implementation of a suite of conservation measures within an area of 382,200 acres to secure and expand the population of fluvial Arctic grayling in the Big Hole River upstream of Dickie Bridge (Figure 1). These conservation measures are designed to improve the function of the aquatic ecosystem, which is expected to lead to an increase in the abundance and distribution of fluvial Arctic grayling in the system. The second purpose is to provide participating non-Federal landowners, in return for their cooperation with implementing conservation measures on their properties, with regulatory assurances and limited exemption from incidental take should fluvial Arctic grayling be listed under the ESA. Collectively, the Agreement's goal is to facilitate sustainable land management operations (primarily livestock ranching) in the Big Hole River valley that is compatible with maintenance and restoration of aquatic habitats upon which fluvial Arctic grayling depend.

The need for the proposed Agreement results from the continued decline of fluvial Arctic grayling throughout their historic range. Fluvial Arctic grayling currently occupy only a fraction (~5%) of their historic range within the Missouri River watershed upstream of the Great Falls (Figures 2 and 3). Kaya (1992a) concluded that the major factors causing the range-wide decline of fluvial Arctic grayling in the upper Missouri River system include habitat degradation, angling exploitation and overfishing, and interactions with introduced nonnative salmonid fishes. Fluvial Arctic grayling in Montana are presently restricted to an approximately 80-mile long segment of the upper Big Hole River, and the USFWS has concluded this remnant population is threatened by ongoing drought, habitat fragmentation and degradation, and encroachment by nonnative trout (70 FR 24898, May 11, 2005).

Historical and contemporary land use in the Big Hole Valley has led to habitat degradation, fragmentation, and loss. Specifically, irrigation diversions have reduced streamflows and may block migratory pathways, and uncontrolled livestock grazing has

destroyed streamside (riparian) habitats. Collectively, these circumstances have led to stream dewatering, elevated summer water temperatures, channel alterations and habitat simplification, and the inability of fluvial Arctic grayling to access necessary habitats. In addition, fluvial Arctic grayling may be accidentally entrained (captured) in irrigation ditches. Brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*) are three species of nonnative trout that have established populations in the system.

Fluvial Arctic grayling in Montana are a species of concern in Montana\*, and the distinct population segment (DPS) for fluvial Arctic grayling of the upper Missouri River, which includes the Big Hole River population, is a Candidate for listing under the ESA (70 FR 24898). In response to a petition to list the fluvial Arctic grayling as endangered, the USFWS determined that listing the fluvial Arctic grayling was warranted but precluded by higher priority listing actions in 1994 (59 FR 37738).

The fluvial Arctic grayling has remained on the ESA Candidate list since the warranted but precluded determination in 1994, but its listing priority number was recently elevated to the highest level afforded a DPS (69 FR 24881) because the abundance of the remnant population in the Big Hole River declined substantially and the reestablishment efforts have not yet produced self-sustaining populations elsewhere in the upper Missouri River.

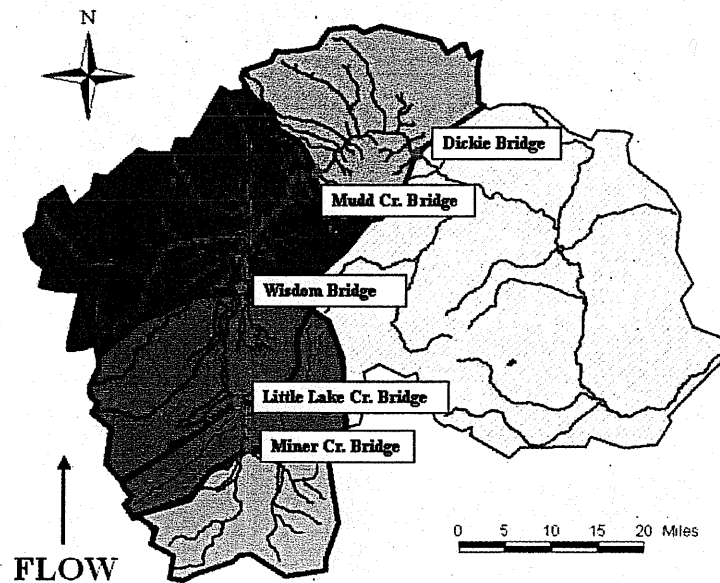
The MFWP has been committed to the protection and restoration of fluvial Arctic grayling throughout its historic range in Montana. In 1996, MFWP signed an MOA with USFWS (MFWP and USFWS 1996) that recognizes the Restoration Plan (MFWP 1995) as the conservation strategy to guide restoration and management of fluvial Arctic grayling in the upper Missouri River. The Restoration Plan was developed by the Workgroup, an interagency committee established in the 1980s to provide guidance on fluvial Arctic grayling restoration, research, and management. The Restoration Plan's general restoration approach is to: a) reestablish four additional fluvial Arctic grayling populations in historic waters, and b) secure and expand the existing population in the Big Hole River. The MFWP, in collaboration with other agencies, has been implementing the MOA and Restoration Plan provisions in good faith. For the past decade, MFWP and USFWS Partners program have engaged Big Hole River valley landowners in small-scale restoration projects to benefit fluvial Arctic grayling. For example, in 2003 MFWP initiated restoration projects including riparian revegetation and fencing along Deep, Lamarche, and Steel Creeks; instream pool construction in a degraded section of Fishtrap Creek, and installation of a fish ladder to permit passage over an irrigation diversion on the North Fork of the Big Hole River (Magee and Lamothe 2004). The USFWS Partners program has provided funding and technical assistance in the installation of 19 off-site watering systems (Magee and Lamothe 2003).

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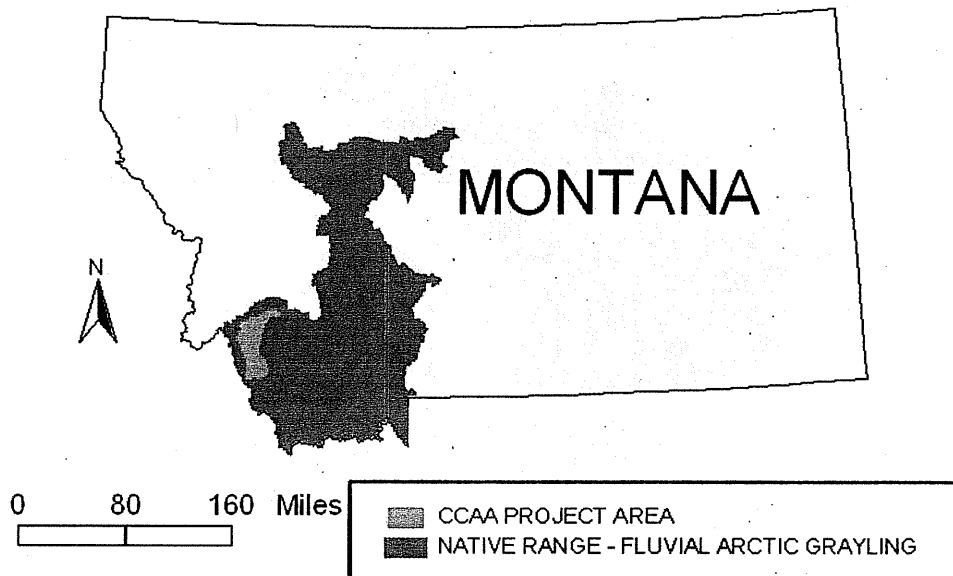
\* Definition of Species of Concern used by MFWP: "The term "Species of Concern" includes taxa that are at-risk or potentially at-risk due to rarity, restricted distribution, habitat loss, and/or other factors. The term also encompasses species that have a special designation by organizations or land management agencies in Montana, including: Bureau of Land Management Special Status and Watch species; U.S. Forest Service Sensitive and Watch species; U.S. Fish and Wildlife Service Threatened, Endangered and Candidate Species (<http://fwp.state.mt.us/fieldguide/statusCodes.aspx#sConcern>). An identical definition is used by Montana Natural Heritage Program (<http://mtnhp.org/SpeciesOfConcern/>)

Recently, NRCS utilized its special initiative EQIP program in the Big Hole to improve habitat conditions for fluvial Arctic grayling. In 2004, NRCS spent over \$700,000 to provide technical and financial assistance to producers willing to shorten their irrigation seasons and implement alternate stock-water methods to provide instream flows for grayling. This program resulted in 14,491 acres of deferred irrigation and construction of 12 off-channel stock watering facilities. In 2005, NRCS committed \$500,000 to provide technical and financial assistance to producers in the upper Big Hole River watershed upstream of Dickie Bridge who install conservation practices in a continuing effort to benefit fluvial Arctic grayling habitat. The 2005 EQIP program focuses primarily on improving the management of irrigation water through the installation of water control structures and measuring devices, and providing grayling passage past irrigation diversion structures. The Big Hole Watershed Committee, a grassroots organization representing landowner interests in the area, received Federal funding to implement on-the-ground habitat restoration projects and is expected to begin implementing some projects in 2005.

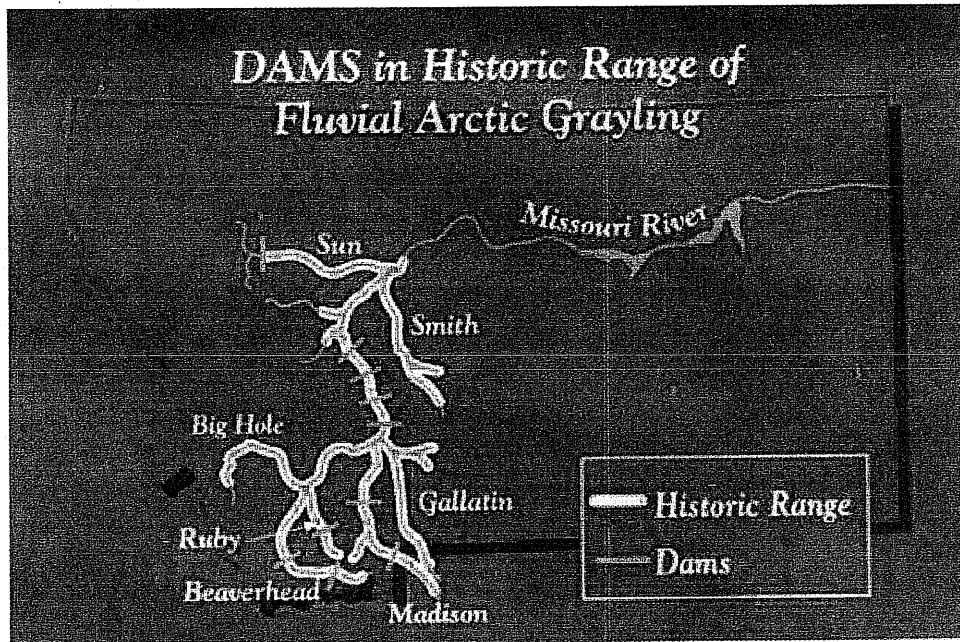
The potential for an ESA listing of fluvial Arctic grayling, which would have economic, legal, and social repercussions for affected individuals; and the large spatial scale at which habitat must be protected and restored has highlighted the need for a more comprehensive, collaborative, and long-term approach to fluvial Arctic grayling conservation in the Big Hole River. The proposed Agreement far exceeds previous restoration activities in the Big Hole in scope and detail. The proposed Agreement would provide ESA regulatory assurances to participating landowners who agree to implement conservation measures necessary to benefit fluvial Arctic grayling, and also would give landowners access to technical expertise and financial support (as needed) from the collaborating agencies to ensure their land management activities are sustainable. Private landowner participation and support is vital to fluvial Arctic grayling conservation in the Big Hole River because the majority of present and historic fluvial Arctic grayling habitat is located adjacent to non-Federal lands (MFWP et al. 2005, 2006; Figure 4).



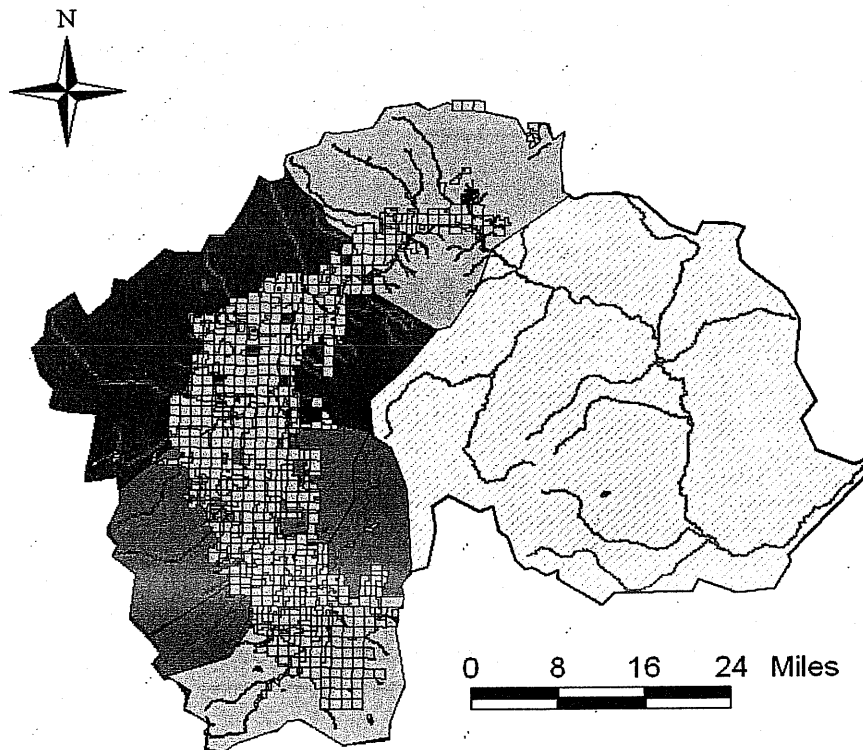
**Figure 1.** Big Hole River watershed in southwestern Montana. The proposed project area contains portions of the watershed upstream from Dickie Bridge that contains most of the habitat occupied by fluvial Arctic grayling in the watershed.



**Figure 2.** Location of the proposed project area in the Big Hole River in relation to the native range of fluvial Arctic grayling.



**Figure 3.** Historic range of fluvial Arctic grayling in the Missouri River above the Great Falls. The current range of fluvial Arctic grayling is restricted to the Big Hole River (map courtesy of MFWP).



**Figure 4.** Distribution of private, non-Federal lands (light blue parcels) representing the 380,000-acre proposed project area in the upper Big Hole River drainage. The lower watershed (at right) is denoted by cross-hatched shading.



### **C. Decision to be Made by the Responsible Official**

The USFWS' decision is whether to issue a section 10(a)(1)(A) Permit and execute the Agreement under the ESA based on the Agreement as proposed, on the Agreement as further conditioned, or to deny the permit application and not approve the Agreement. To issue the Permit, the USFWS must find that--1) the taking of fluvial Arctic grayling that is incidental or purposeful would be lawful and in accordance with the terms of the Agreement; 2) the Agreement complies with the requirements of the CCAA policy; 3) the probable direct and indirect effects of any authorized take would not appreciably reduce the likelihood of survival and recovery in the wild of any species; 4) implementation of the terms of the Agreement is consistent with applicable Federal, State, and tribal laws and regulations; 5) implementation of the terms of the Agreement would not be in conflict with any ongoing conservation programs for species covered by the Permit; and 6) MFWP has shown capability for and commitment to implement all the terms of the Agreement. To approve and execute a CCAA, the USFWS must determine that the benefits of the conservation measures implemented by a property owner under a CCAA, when combined with those benefits that would be achieved if it is assumed that conservation measures also were to be implemented on other necessary properties, would preclude or remove any need to list the covered species (64 FR 32727).

Issuance of the Permit and execution of a CCAA are Federal actions subject to NEPA. The USFWS' Region 6 Director or his designee is the official responsible for selecting an alternative and issuing a decision document with respect to NEPA. If the Regional Director determines that the preferred alternative would not significantly impact the quality of the human environment as defined in section 102(2)(C) of NEPA, a decision in the form of a FONSI would be issued. The Regional Director could warrant that the proposed action requires further analysis in an EIS if a determination is made that the preferred alternative would significantly impact the human environment.

The MFWP's decision is whether or not to implement the Agreement (Alternative A), to implement the Agreement as proposed (Alternative B), or to implement the Agreement with a more limited scope (Alternative C). This State's decision is subject to MEPA and will be based on a finding of whether or not there will be a significant impact on the quality of the human environment. The MFWP's Region 3 Supervisor is responsible for MFWP's implementation decision. Once a determination has been made, MFWP will issue a Decision Notice.

### **D. Issues Raised During Planning**

Four general issues were considered during the development of the proposed Agreement--(1) roles and responsibilities of the partnering agencies, (2) expected landowner interest and participation in the Agreement, (3) minimum standards for landowners to be included in the Agreement, and (4) effects of nonnative trout on fluvial Arctic grayling.

The proposed Agreement is intended to be a collaboration among Participating Landowners and MFWP, NRCS, MDNRC, and USFWS. The MFWP agreed to serve as the applicant for the ESA section 10 Permit and has assumed the role of lead agency in making contacts with interested landowners, coordinating the on-the-ground development and implementation of the Agreement's provisions, and monitoring compliance and effectiveness for the Agreement. The NRCS agreed to provide technical expertise in the collection of baseline information, planning, and implementation the portion of the Agreement's site-specific plans dealing with agricultural and ranching operations (e.g., irrigation systems, grazing plans, crop management, nutrient management, etc.). The MDNRC has agreed to provide expertise in hydrology, water management, and State water law that would be required to address one of the Agreement's central issues--water and the competing uses for that water. The USFWS has agreed to provide technical and field assistance in the development and implementation of plans, and maintains an oversight role in the approval of site-specific plans and compliance with applicable Federal laws.

The MFWP, NRCS, MDNRC, and USFWS (Agencies) were initially uncertain about the willingness of landowners in the Big Hole River to enter into an Agreement with State and Federal agencies that would affect how they conducted their agricultural and ranching operations. Meetings and informal communication with individuals or small groups of non-Federal landowners from the upper Big Hole River watershed indicated strong interest in such an Agreement as a means to address long-term needs of fluvial Arctic grayling and provide some certainty their livelihoods would not be unduly affected by the ESA. In addition, over three dozen landowners, who collectively represent 200,000 acres of the proposed Agreement's 380,000-acre project area, signed a MFWP application affirming their willingness to participate in the proposed Agreement in April 2005. These same landowners are voluntarily implementing some of the same conservation measures described in the Agreement, so it is anticipated that these same landowners also would officially enter in the proposed Agreement if it was approved by USFWS.

The third issue relates to the consistency in the requirements of the proposed umbrella Agreement for Participating Landowners whose site-specific issues would differ. To ensure consistency and a set of minimum requirements, all Participating Landowners agree to four general conservation measures to benefit fluvial Arctic grayling-- (1) improving instream flows; (2) conserving or restoring riparian habitats; (3) removing barriers to fluvial Arctic grayling migration; and (4) reducing or eliminating entrainment in irrigation ditches. Through the development of the site-specific plans that are consistent with the Agreement's general provisions, the Agencies and the Participating Landowner maintain the flexibility to address the threats and conservation opportunities identified on each enrolled property. An overall requirement of the Agreement and in any site-specific plan is allowing Agency access to enrolled lands for data collection,

plan development and implementation, and monitoring. These measures described above, and implemented at the site-specific level, would result in a net benefit to fluvial Arctic grayling.

Competition and predation from nonnative trout species, including brook trout, brown trout and rainbow trout, are considered potential threats to fluvial Arctic grayling in the proposed Agreement's project area. However, threats from nonnatives are believed to be secondary to threats from habitat degradation and loss, and would be outside the direct control of Participating Landowners. The Agreement necessarily focuses on measures private landowners can take to improve habitat conditions for fluvial Arctic grayling on their property, but the Agreement includes provisions for the Agencies to address and deal with threats to fluvial Arctic grayling from nonnative trout as the need arises.

## **II. ALTERNATIVES INCLUDING THE PROPOSED ACTION**

Each of the alternatives was developed with the objective of reducing or eliminating threats to fluvial Arctic grayling to secure and expand the population in the Big Hole River, Montana. General threats include habitat degradation, loss and fragmentation resulting from irrigation diversions, riparian habitat destruction, physical barriers to fluvial Arctic grayling movement, and entrainment in irrigation ditches. With this objective in mind, three alternatives have been developed for analysis in this EA.

### **A. Alternative A - NO ACTION**

Under the "No Action" alternative, the proposed Agreement would not be approved by USFWS and the Permit would not be issued to MFWP and the Agreement would not be implemented by MFWP. Thus, Participating Landowners would not be covered under the umbrella Agreement or Permit. Agricultural and ranching activities would continue within the Project Area in accordance with applicable laws, likely similar to current activities for many landowners. The predominant land use in the Project Area is irrigated agriculture for hay production and livestock pasture.

The certainty that conservation measures would be comprehensively implemented to benefit fluvial Arctic grayling is much less under the "No Action" alternative. Various State, Federal, and private groups have been involved in projects to improve habitat conditions for fluvial Arctic grayling in the project area, but such projects have generally not been coordinated or systematically implemented on a large scale. The Workgroup was established in the 1980s as an interagency committee to provide guidance on fluvial Arctic grayling research, management, and restoration. The Workgroup developed a Restoration Plan that included monitoring goals for the fluvial Arctic grayling population in the Big Hole River. For the past decade, MFWP and the USFWS Partners program have engaged Big Hole River valley landowners in small-scale restoration projects to benefit fluvial Arctic grayling MFWP. For example, in 2003 MFWP initiated restoration projects including riparian revegetation and fencing along Deep, Lamarche, and Steel Creeks; in-stream pool construction in a degraded section of Fishtrap Creek, and installation of a fish ladder to permit passage over an irrigation diversion on the North Fork of the Big Hole River (Magee and Lamothe 2004). The USFWS Partners program has provided funding and technical assistance in the installation of 19 off-site watering systems (Magee and Lamothe 2003). Recently, NRCS utilized its special

initiative EQIP program in the Big Hole to improve habitat conditions for fluvial Arctic grayling. In 2004, NRCS spent over \$700,000 to provide technical and financial assistance to producers willing to shorten their irrigation seasons and implement alternate stock-water methods to provide instream flows for grayling. This program resulted in 14,491 acres of deferred irrigation and construction of 12 off-channel stock watering facilities. In 2005, NRCS committed \$500,000 to provide technical and financial assistance to producers in the upper Big Hole River watershed upstream of Dickie Bridge who install conservation practices in a continuing effort to benefit fluvial Arctic grayling habitat. The 2005 EQIP program focuses primarily on improving the management of irrigation water through the installation of water control structures and measuring devices, and providing grayling passage past irrigation diversion structures. The Big Hole Watershed Committee, a grassroots organization representing landowner interests in the area, received Federal funding to implement on-the-ground habitat restoration projects and is expected to begin implementing some projects in 2005.

It is likely that many of these types of activities would continue to occur under Alternative A; however, fluvial Arctic grayling are strongly affected by land and water use on private lands and landowner attitude toward the species is an important conservation consideration. The State and Federal agencies active in fluvial Arctic grayling conservation are concerned that, should fluvial Arctic grayling be listed under the ESA, landowner concerns over potential land- and water-use restrictions could be a disincentive for them to cooperate and fluvial Arctic grayling conservation efforts could be hampered.

Successful conservation and recovery of fluvial Arctic grayling in the Project Area would require the active participation of private landowners willing to implement measures to provide adequate instream flows, restore degraded riparian habitats, and reduce habitat fragmentation from barriers and diversion structures. Without cooperation from these landowners, the prospects for conservation and recovery of grayling would be compromised.

The fluvial Arctic grayling population in the Project Area is currently at very low abundance. Under the "No Action" alternative, habitat conditions may improve or certain threats may be addressed at specific locations in the watershed. However, conservation measures implemented under Alternative A are not expected to be comprehensively applied, and the continuation of current land and water use practices are expected to remain a substantial threat to the long-term survival of fluvial Arctic grayling.

## **B. Alternative B (Preferred Alternative) - PROPOSED ACTION**

Under the Proposed Action, Alternative B, the umbrella Agreement (MFWP et al. 2005, 2006) would be approved for a Project Area of approximately 380,000 acres, the Permit would be issued to MFWP which would implement the umbrella Agreement as written, and up to 318 non-Federal property owners would be able to enroll under the Agreement through CIs and be covered under the Permit. The Agreement would be a partnership between Participating Landowners and the Agencies (MFWP, NRCS, MDNRC, and USFWS). Participating Landowners would implement, or coordinate with the Agencies to implement, fluvial Arctic grayling conservation measures on their land as identified in the Agreement and in their individual site-specific plans. The Agreement would describe specific land-use activities and conservation practices that would be beneficial to the species on non-Federal lands. In exchange for volunteering to implement beneficial practices for fluvial Arctic Grayling, the participating landowners would receive incidental take authorization (at a specified level) under an Permit issued pursuant to section 10(a)(1)(A) of the ESA and would receive assurances from the FWS that their agricultural and ranching activities would not be curtailed beyond what was stipulated in the Agreement and their individual site-specific plans if the species is listed under the ESA. The Permit would become effective if the fluvial Arctic grayling was subsequently federally listed, and would then authorize a level of 'take' for each enrolled landowner. Thus, an operational conservation program would be in place that would improve the species status, and the participating non-Federal landowners would benefit by receiving incidental take authority and assurances that they can continue with agreed upon land uses.

Conservation measures to be implemented under the Agreement and in each Participating Landowner's comprehensive site-specific plan, as applicable, can be grouped into four general categories--1) improving instream flows, 2) conserving or restoring riparian habitats, 3) removing barriers to fluvial Arctic grayling movement, and 4) addressing entrainment threats. Examples of specific actions under each of the general measures are listed below:

- 1) **Improving Instream Flows.** Specific actions include, but are not limited to--1) upgrading irrigation structures to improve control over water diversion and delivery; 2) compliance with water rights; 3) repairing leaking head gates and water diversion structures; 4) reducing irrigation withdrawals; 5) improving irrigation ditches to reduce water losses; 6) installing and maintaining off-stream livestock watering facilities; 7) investigating and using alternative less-water intensive livestock forage; and 8) implementing a comprehensive irrigation water management plan developed by NRCS.
- 2) **Conserving or Restoring Riparian Habitats.** Specific actions include, but are not limited to--1) installing and maintaining fences that manage livestock within or exclude livestock from the riparian zones; 2) installing and maintaining off-stream livestock watering facilities; 3) replanting or transplanting native riparian vegetation such as willows; 4) implementing prescribed grazing plans; and 5) curtailing or relocating any ranching activities that degrade riparian habitats.



- 3) **Removing Barriers to Fluvial Arctic Grayling Movement.** Specific actions include, but are not limited to--1) removing physical barriers to restore a "natural" stream channel; 2) installing fish ladders or other appropriate fish passage devices to permit fluvial Arctic grayling movement past irrigation structures (diversions) at all flows; and 3) redesigning and reconstructing diversion structures to facilitate fish passage where ladders or retrofitting is not feasible.
- 4) **Addressing Entrainment Threats.** Specific actions include, but are not limited to--1) permitting the Agencies access to irrigation ditches to perform surveys leading to a comprehensive assessment of entrainment threats; 2) allowing the Agencies to rescue entrained fluvial Arctic grayling; and 3) installing fish screens or other fish-exclusion devices as necessary to eliminate specific entrainment problems.

Complementary conservation measures or actions implemented by Participating Landowners under the Agreement that would benefit fluvial Arctic grayling include:

- 1) Allowing the Agencies to conduct an assessment of baseline environmental conditions and land use practices necessary to develop a comprehensive site-specific plan for their enrolled lands. Implementation of the site-specific plan, would meet the conservation guidelines of this Agreement.
- 2) Allowing translocation of fluvial Arctic grayling into suitable unoccupied habitats in streams on or adjacent to their enrolled lands to expand the distribution and abundance of fluvial Arctic grayling.
- 3) With agreed-to notification, allow agency or agency representative access to Participating Landowner's property for the purposes of--1) assessing the fishery resources and status of fluvial Arctic grayling in natural streams and irrigation ditches; 2) salvage of entrained fish in irrigation ditches; 3) removing barriers; 4) assessing riparian habitat conditions and associated land-use activities; 5) implementing conservation measures, and conducting compliance; and 6) biological monitoring pursuant to the Agreement and site-specific plan.
- 4) Actively pursuing funding, as necessary, to implement the Agreement and site-specific plans.

The Agreement provides a framework for the development and implementation of conservation measures and site-specific plans which involves the coordinated efforts of State and Federal agencies (i.e., MFWP, NRCS, MDNRC, and USFWS) with expertise in fishery biology and management; wildlife biology; hydrology; and all aspects of agricultural, irrigation, and grazing management. Each of the agencies would have specific compliance and effectiveness monitoring duties under the terms of the Agreement.

Under this alternative, an umbrella Agreement would be initiated over a Project Area of approximately 380,000 acres and could involve up to 318 private property owners. The threats to fluvial Arctic grayling exist throughout the Project Area. Fluvial Arctic

grayling are very mobile and may move tens of miles on a seasonal basis. The Agencies determined that a coordinated conservation effort involving all possible interested landowners would be the most effective strategy to reduce or eliminate threats to fluvial Arctic grayling at a scale commensurate with the ecology of the species. Providing Participating Landowners with ESA regulatory assurances should reduce concerns over a potential listing and enhance landowner cooperation in fluvial Arctic grayling conservation efforts. Thus, under Alternative B, the proposed action, conservation measures would be implemented such that fluvial Arctic grayling habitat would be protected and enhanced over a large area. Improved habitat conditions are anticipated to produce an increase in the abundance and distribution of fluvial Arctic grayling in the Big Hole River, thus greatly increasing the probability of long-term persistence for the species.

Private landowner interest in the proposed project appears to be considerable. In April 2005, MFWP and NRCS announced a program for landowners in the upper Big Hole River Valley to implement actions to benefit fluvial Arctic grayling and participate in a voluntary irrigation reduction program during 2005. The MFWP made available "Applications for Development of a Site-Specific Plan for a Potential CCAA for fluvial Arctic grayling" to address species needs in 2005 and to obtain information from individuals interested in voluntarily participating in a potential umbrella Agreement for fluvial Arctic grayling (i.e., the proposed action, Alternative B). Over three dozen landowners who cumulatively own over 200,000 acres (or 51% of the proposed project area) indicated their willingness to MFWP to participate in an Agreement have voluntarily begun to implement some of the conservation measures described in the Agreement (MFWP, Dillon, Montana, unpublished data). These 200,000+ acres also represent areas of high habitat significance for fluvial Arctic grayling (MFWP et al. 2005, 2006).

### **C. Alternative C – LIMITED UMBRELLA AGREEMENT**

Under Alternative C, a "limited" umbrella Agreement would be implemented in only a portion of the Project Area described in Alternative B (Proposed Action). This limited umbrella Agreement would generally correspond to the portion of the upper Big Hole River watershed characterized as Management Segment C in the Proposed Action (MFWP et al. 2005, 2006; see Appendix 1). The project footprint for Alternative C would include approximately 130,000 acres of non-Federal lands in the vicinity of Wisdom, Montana. The Big Hole River in and near Wisdom is considered an important spawning and rearing area for fluvial Arctic grayling, but the habitat in that river segment has been degraded and the fluvial Arctic grayling abundance is currently very low (MFWP et al. 2005, 2006). The Agencies generally consider restoration of this section of the river a priority.

Assuming the "limited" umbrella Agreement would be structured similarly to the Umbrella Agreement described under Alternative B, (same agencies and conservation framework), then a Permit would be issued to MFWP, and up to 131 non-Federal property owners would be able to enroll through CI and be covered under the Permit.

The Agreement would be a partnership between Participating Landowners and MFWP, USFWS, NRCS, and MDNRC (the Agencies). Participating Landowners would implement, or coordinate with the Agencies to implement fluvial Arctic grayling conservation measures on their land as identified in the Agreement and in their individual site-specific plans. Participating Landowners would receive, should the species be listed under the ESA, incidental take authorization (at a specified level) for fluvial Arctic grayling and would receive regulatory assurances from USFWS that their agricultural and ranching activities would not be curtailed beyond what was stipulated in the Agreement and their individual site-specific plan. The conservation measures under the limited umbrella Agreement would be identical to those described under Alternative B, and will not be repeated here.

Providing Participating Landowners with ESA regulatory assurances should reduce concerns over a potential listing and enhance landowner cooperation in fluvial Arctic grayling conservation efforts, but these positive developments would be restricted to only a portion of the non-Federal lands in the upper Big Hole River watershed. Consequently, limiting enrollment would likely exclude landowners who would be interested in participating in the conservation of fluvial Arctic grayling and receiving regulatory assurances under the ESA in return. Should fluvial Arctic grayling be listed under the ESA, landowners outside the limited umbrella Agreement area would create similar issues to those described under the "No Action" alternative whereby concerns over potential land- and water-use restrictions could be a disincentive for them to cooperate and fluvial Arctic grayling conservation efforts could be hampered.

Moreover, a limited umbrella would have reduced conservation benefits for fluvial Arctic grayling in the watershed. Fluvial Arctic grayling are mobile and use habitats separated in both time and space at different stages in their life, so biologically realistic conservation strategy for the species in the system requires threats be addressed at a watershed scale. The threats to fluvial Arctic grayling from land and water use activities extend across the upper watershed, so focusing on a single area disregards significant threats in other locations. This is particularly relevant for the irrigation-related threats facing fluvial Arctic grayling in the Big Hole River, because, for example, improvements to instream flows produced by Participating Landowners at one point in the river could be quickly offset by irrigation diversions from non-participants just downstream. While a limited umbrella Agreement would be expected to result in some conservation benefit to fluvial Arctic grayling, it would be significantly less than that expected if the measures were to be implemented across as large an area as possible and the probability of long-term persistence of fluvial Arctic grayling may be correspondingly reduced.

#### **D. Alternatives Eliminated From Consideration**

Two alternatives were eliminated from consideration for logistical reasons--a range-wide umbrella Agreement and individual landowner-by-landowner Agreements covering the same area as the proposed action. A range-wide umbrella Agreement for fluvial Arctic grayling would extend outside the Big Hole River system and include other drainages in

the upper Missouri River system where fluvial Arctic grayling historically occurred and where fluvial Arctic grayling reintroduction projects may be planned or ongoing. As such, translocation efforts to reestablish fluvial Arctic grayling populations would be the focus in project areas outside of the Big Hole River. This alternative was eliminated as logistically unfeasible given current staffing and financial resources for the participating Agencies who determined the best use of these resources would be to focus on securing the remaining fluvial Arctic grayling population in the Big Hole River.

A landowner-by-landowner approach also was rejected as logistically unfeasible. Under this alternative, USFWS would make individual agreements and issue section 10 permits to each landowner interested in fluvial Arctic grayling conservation across the same project area described in the Proposed Action, Alternative B. The regulatory assurances and types of conservation measures implemented would be similar to those described in the Proposed Action. The landowner-by-landowner alternative was removed from consideration because USFWS does not currently have the resources to implement the Agreement in this manner and the cumulative conservation benefits to fluvial Arctic grayling would be diminished compared to the umbrella approach. The landowner-by-landowner alternative would require USFWS to develop, approve, and implement up to 318 individual plans (i.e., number of non-Federal landowners in the project area). The complexity of individual plans would vary, but many would be expensive and time-consuming to develop and would potentially replicate much of the efforts in the initial development of an umbrella Agreement. The time required to process up to 318 individual applications would likely result in less landowner participation and ultimately slow the actual implementation of conservation measures that are urgently needed to help fluvial Arctic grayling in the project area. Thus, implementation of a landowner-by-landowner alternative would result in a piecemeal approach, less effective comprehensive conservation planning compared with the umbrella Agreement, and significantly reduced conservation benefits to fluvial Arctic grayling.

The USFWS also considered modifying Alternative C to give individual landowners excluded from the Project Area the option of individual Agreements. The USFWS would make individual agreements and issue section 10 permits to each landowner interested in fluvial Arctic grayling conservation in the excluded sections. The regulatory assurances and types of conservation measures implemented would be similar to those described in the Proposed Action. However, this modification was rejected for reasons similar to the landowner-by-landowner option above. In addition to being logistically unfeasible and time consuming, the action would bear little difference to the Proposed Action while requiring a more cumbersome process.

The USFWS considered a modified version of the Proposed Action that included only private property owners with lands adjacent to the Big Hole River and its tributaries upstream of Dickie Bridge. This alternative would be an umbrella agreement with the permit held by MFWP, and the regulatory assurances and types of conservation measures implemented would be similar to those described in the Proposed Action. This alternative could enroll up to 132 private landowners whose properties totaled more than

170,000 acres. This alternative would provide important protections for the riparian habitat in the upper Big Hole River watershed, and involve a number of landowners with senior water rights. However, this option was rejected because it would exclude those private landowners that held water rights but irrigated hay fields, pasture, or stock some distance from the river. Moreover, individual irrigation ditches may service multiple landowners, some of whom may not own property adjacent to the stream or river and would not be eligible to participate in such an agreement. The cooperative nature of the irrigation system in the upper watershed thus requires an integrated conservation program that can include all private property owners.



**Table 1.** List of representative activities that are likely to be implemented to benefit fluvial Arctic grayling under the four general categories of conservation measures outlined in the proposed project (Alternative B). The same or similar measures may be implemented under Alternative C, and to a lesser extent Alternative A. The right-hand column indicates whether the action or practices involves potential temporary or short-term ground disturbance.

General Measure	Strategy	Specific Action or Facilitating Practices	Temporary or Short-term Ground Disturbance
Improve streamflows	Compliance with water rights Voluntary irrigation reductions	Regulate diversion	No
		Regulate diversion	No
	NRCS' Irrigation Water Management plan	Replace or repair headgates	Yes
		Replace or repair diversion structures	Yes
		Ditch lining or modification of existing conveyance	Yes
		Irrigation canal or field ditch	Yes
		Irrigation Land Leveling	Yes
		Land Smoothing	Yes
		Utilize livestock forage with less water demand/Pasture & Hay Planting	Unknown
		Construct groundwater wells	Yes
		Construct off-channel livestock watering facilities	Yes
		Install piping for water transport	Yes
Conserving or restoring riparian habitats	Passive riparian restoration	Prescribed grazing - Fencing livestock	Yes
		Moving livestock (rotational grazing)	No
	Active riparian restoration	Replanting willow, natural vegetation, or other riparian herbaceous cover (channel bank vegetation)	Yes
	Active channel restoration*	Excavate pools	Yes
		Bank stabilization	Yes
Provide passage for fluvial Arctic grayling	Removal or installation of necessary structures	Channel Stabilization	Yes
		Install fish passage	Yes
		Remove barriers	Yes
Reducing Entrainment threats	Mitigation	Redesign and install "fish-friendly" diversions	Yes
		Rescue entrained fluvial Arctic grayling	No
	Installation of necessary structures	Reduce diversion volume & timing of withdrawals	No
		Install fish screen	Yes
Reduce stream nutrient loading†	NRCS 'Nutrient management guidelines	Redesign diversion and flow regulation structures	Yes
		Reduced fertilizer application	No
		Manure transfer away from streams	No

Restoration of channel morphology and function would be achieved primarily through the interactive effects of improved streamflows and restored riparian habitats. However, active channel restoration may be necessary. Although "Reduce stream nutrient loading" is not listed among the four general categories of conservation measures, it is highly probable given anecdotal reports on current conditions in the proposed project area that NRCS guidelines for nutrient management would be used to address nutrient loading issues on specific properties.

### III. AFFECTED ENVIRONMENT

#### A. Introduction

The lands to be included in the proposed action and for analysis in this EA include the Big Hole River watershed in Beaverhead and Deerlodge Counties in southwestern Montana (Figures 1-5). The entire Big Hole River watershed is 1,785,600 acres (HUC# 10020004), and the watershed area upstream of Dickie Bridge, which is being defined as the "upper Big Hole River watershed" in the context of the proposed action, is about 1,026,099 acres. The project area includes over 388,000 acres of non-Federal lands in the upper watershed. Approximately 80.6% of the project area is in Beaverhead County while the remainder is in Deerlodge County. The project area includes about 6-7% of the believed historical distribution of fluvial Arctic grayling in native waters of the upper Missouri River system. The subsequent descriptions and detailed analyses of the affected environment contain information at a spatial scale greater than the proposed project area because some data were only available by total watershed area or county.

The Big Hole River drains an approximately 1.8 million-acre (ca. 2,800-square mile) intermontane basin characterized as the highest and widest mountain valley of southwestern Montana with much of the valley floor above 1,800 meters (6,000 feet) elevation (Figure 5). The river's headwaters are located in the Beaverhead Mountains of the Bitterroot Range southwest of Jackson, Montana. The river flows for about 150 miles before its confluence with the Beaverhead River at Twin Bridges to form the Jefferson River, a major tributary to the Missouri River to the east (Figure 3).

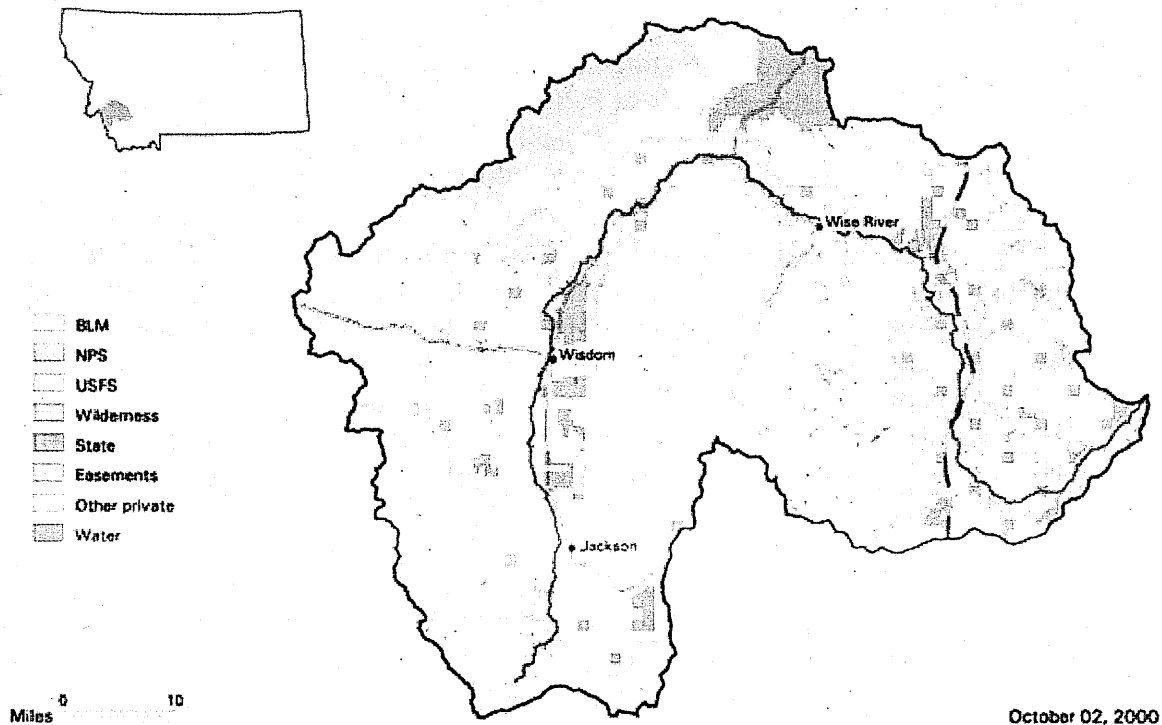
The upper watershed's climate is characterized by long cold winters, short hot summers and low annual precipitation (in valley locations). Much of the project area can be described as high elevation semi-arid rangeland. The area around Wisdom receives an average of around 28 centimeters/yr (11 inches/yr), while the headwater locations may average greater than 127 centimeters/yr (50 inches/yr) (Upper Big Hole River Total Maximum Daily Load [TMDL] 2003). Sub-zero temperatures are common in winter, maximum daily temperatures are below freezing an average of 75 days/yr, and the area has only about 88 frost-free days per year (Upper Big Hole River TMDL 2003). Vegetation is typical for higher-elevation sites in the Rocky Mountain ecoregion. Mountain areas are predominantly coniferous forests (e.g., lodgepole pine and Douglas fir), transitioning to mixed sub-alpine forest and mesic shrubs in the mid-elevation foothills, with sagebrush, grasslands, and agricultural lands in the valley bottom.

The Big Hole River watershed is situated in the thrust belt of the Northern Rocky Mountain physiographic province (Marvin and Voeller 2000). The mountains delineating the watershed are mostly "uplifted Proterozoic and Cretaceous sedimentary and igneous rocks" (Marvin and Voeller 2000). Much of the valley bottom is characterized as "Quaternary alluvial and glacial deposits often overlying Tertiary aged sedimentary rocks of the Bozeman Formation" (Upper Big Hole River TMDL 2003). Sediment fill deposits in the upper basin can be in excess of 10,000 feet thick (Marvin and Voeller 2000; Upper Big Hole River TMDL 2003).

Much of the watershed is under public ownership. Approximately 67% of the watershed is owned by the Federal government (58% U.S. Forest Service [USFS] 9.4% Bureau of Land Management [BLM], and 0.04% National Park Service [NPS]) and 3.4% is owned by the State of Montana. The remaining 28.9% is privately owned (data from Table 1 in Marvin and Voeller 2000). The public lands are predominately located in the foothills and mountains and managed by the USFS and BLM (Figure 5). The valley bottoms are mostly privately and State owned and managed for hay production and livestock grazing on large ranches. The Big Hole Valley is rural and has only about 900 residents (>[montanapartners.fws.gov/mt3c.htm](http://montanapartners.fws.gov/mt3c.htm)<), but the watershed is extensively used for dispersed recreation, hunting and fishing.

Fluvial Arctic grayling are found primarily in the low-gradient reaches of the river and tributary streams located in the valley bottoms of the upper watershed, thus the majority of presently occupied fluvial Arctic grayling habitat in the Big Hole River watershed is adjacent to non-Federal lands in the proposed project area. The non-Federal lands in the project area, being characteristic of the valley bottom, are primarily sagebrush and low cover grassland, with a thin strip of vegetation (primarily willows) in remaining intact riparian habitats.

### Big Hole River Watershed (1,800,000 acres)



**Figure 5.** The Big Hole River watershed in southwestern Montana, with headwaters situated at bottom left of map. Map courtesy of the USFWS' Montana Partners (><http://montanapartners.fws.gov/images/bh1.jpg><).

## **B. Ecology of Fluvial Arctic Grayling**

Fluvial (river-dwelling) Arctic grayling are adapted to life-long residence in stream environments and can make long seasonal migrations between spawning, feeding and wintering areas within the river systems they inhabit (Shepard and Oswald 1989, Lamothe and Magee 2003). Fluvial Arctic grayling inhabit cool water streams having low-to-intermediate gradients, and prefer pool habitat (Kaya 1990; Byorth and Magee 1998). In Montana, fluvial Arctic grayling spawn from late April to mid May by depositing adhesive eggs over sand and gravel without excavating a redd or nest (Kaya 1990; Shepard and Oswald 1989). Eggs develop and hatch within a few weeks. The weakly swimming young-of-the-year fluvial Arctic grayling prefer slow-water rearing habitat along vegetated and unvegetated stream margins with velocity refuges, back-waters in side channels, or adjacent to beaver dams. Young-of-the-year fluvial Arctic grayling grow quickly, and can attain a size of 145 millimeters (>5 inches) by end of their first summer (Magee and Lamothe 2004). Fluvial Arctic grayling in Montana typically reach maturity in their third or fourth year of life, and seldom live beyond age-6 (Magee and Lamothe 2003). Fluvial Arctic grayling of all ages feed opportunistically on drifting invertebrates (Hughes 1992, 1998). The aggressive feeding behavior of fluvial Arctic grayling is linked to their pattern of habitat selection. Adult fluvial Arctic grayling prefer deep pools (Lamothe and Magee 2003, 2004), and may use water depth and turbulence as cover from avian and terrestrial predators.

### **(1) Population Status of Fluvial Arctic Grayling**

The indigenous fluvial Arctic grayling of the upper Missouri River basin was widely but irregularly distributed above the Great Falls (Vincent 1962), and inhabited up to 2,000 kilometers (1,250 miles) of stream habitat in Montana and portions of northwestern Wyoming until the early 20th century (Kaya 1990, 1992a). In addition to the waters of the mainstem upper Missouri River, fluvial Arctic grayling were documented in the drainages of the Sun, Smith, Jefferson, Beaverhead, Big Hole, Madison, Gallatin, Gibbon, and Firehole Rivers, and Grayling, Bridger, Bozeman, and Fan Creeks. Present fluvial Arctic grayling distribution has been reduced to less than 5% of its historic range, and the only remaining indigenous self-sustaining confirmed fluvial population is found in an approximately 80-kilometer (50-mile) segment of the upper Big Hole River and associated tributary streams (Shepard and Oswald 1989; Kaya 1990, 1992a). The core of this population is contained within the project area of the proposed action.

The fluvial Arctic grayling inhabiting the Big Hole River are part of the DPS that has been considered a candidate for listing under the ESA since 1994. The listing priority number for the fluvial Arctic grayling is currently the highest that can be assigned to a DPS, in recognition that the last remaining fluvial population in the Big Hole River is at very low abundance and at risk from combined effects of existing land and water use practices in the system and continuing widespread drought in southwestern Montana

(70 FR 24898, May 11, 2005). Descriptions of the specific threats facing fluvial Arctic grayling in the Big Hole River watershed and in the project area for the proposed action are described below.

## **(2) Threats to Fluvial Arctic Grayling**

### **1) The present or threatened destruction, modification, or curtailment of its habitat or range.**

The majority of the historic range of the upper Missouri River fluvial Arctic grayling DPS has been altered by the construction of dams and reservoirs that created barriers that have obstructed migrations to spawning, wintering or feeding areas; inundated fluvial Arctic grayling habitat; and impacted the historical hydrology of river systems (Kaya 1990). In the Big Hole River watershed, local land and water use has affected surface water hydrology, riparian zone conditions, stream morphology, thermal characteristics, and possibly nutrient inputs to the aquatic system (Kaya 1990; OEA Research, Inc., [OEA] 1995; Lohr et al. 1996; Lamothe and Magee 2004; Upper Big Hole River TMDL 2003). The operation of irrigation systems in the Big Hole has apparently led to direct fragmentation of stream habitats.

**Surface Water Hydrology** - The predominant land use in the upper Big Hole watershed is irrigated agriculture for hay production and livestock pasture. Irrigation demands on the system are very high because of over-allocation of water rights, difficult to control and inefficient surface water (flood) irrigation systems, a recent shift to increased pasture grazing, and a continuing drought. These demands have resulted in significantly reduced instream flows that pose a major threat to fluvial Arctic grayling. Reduced streamflows can reduce the growth and survival of fluvial Arctic grayling through reduction of available habitat.

**Riparian Zone (Streamside) Conditions** - Riparian zones are critical for the ecological function of most aquatic systems (Gregory et al. 1991). Riparian habitats dissipate stream energy during floods, filter sediments and pollutants, facilitate groundwater recharge, cool streams by shading, stabilize streambanks, maintain channel characteristics, promote floodplain development, and input woody debris, organic material, and terrestrial insects (e.g., Murphy and Meehan 1991; Prichard et al. 1998). Loss of riparian zones through streamside livestock grazing and direct removal of natural vegetation has led to degradation of adjacent stream habitat in the upper Big Hole River (OEA 1995; Upper Big Hole River TMDL 2003; Lamothe and Magee 2004). Healthy riparian corridors are vital for maintaining instream habitat for fluvial Arctic grayling in the upper Missouri River basin.

**Stream Morphology** - The combination of reduced instream flows and loss of riparian habitats in the Big Hole River has led to decreased channel stability, increased erosion, and channel widening (e.g., Upper Big Hole River TMDL 2003). In concert, these changes have led to habitat simplification such as a reduction in



pool and riffle sequences. Reduced habitat diversity affects fluvial Arctic grayling by decreasing the distribution and frequency of necessary spawning, feeding and refuge habitats.

**Water Quality: Thermal Impairment and Nutrients** - Reduced stream flows during summer, reduced shading because of riparian vegetation removal, and channel widening are factors that have combined to increase water temperatures by making surface waters more sensitive to solar radiation. Thermal alterations via increased summer water temperatures pose a threat to fluvial Arctic grayling in the mainstem Big Hole River (e.g., Lohr et al. 1996; Magee and Lamothe 2004).

Nutrient enrichment may be a potential problem in the upper Big Hole River (Upper Big Hole River TMDL 2003 and reference therein). Further data are needed to determine if nutrient enrichment is affecting water quality to the extent that fluvial Arctic grayling are being harmed. However, the potential for fertilizers applied to irrigated lands and livestock waste to provide a source of nutrients to the river appears substantial given the surface (flood) irrigation techniques utilized in the upper Big Hole basin.

**Habitat Fragmentation** - Habitat fragmentation is often considered one of the most significant threats to the survival to salmonid fishes in the western United States (Behnke 2002). In addition to the effects of habitat loss and fragmentation from stream dewatering by irrigation, the presence and operation of irrigation diversions can fragment fluvial Arctic grayling habitat in two additional ways. First, cross-channel diversions may block fish passage under all or some flow conditions, impeding fluvial Arctic grayling access to necessary spawning, rearing and refuge habitats. Second, irrigation diversions and ditches may entrain (inadvertently capture) fluvial Arctic grayling (e.g., Shepard and Oswald 1989).

## **2) Overutilization for commercial, recreational, scientific, or educational purposes.**

Fluvial Arctic grayling in the upper Big Hole River are physically handled for recreational and scientific purposes. Fluvial Arctic grayling are easily caught by anglers (e.g., Alberta Sustainable Resource Development 2005), and historical angling exploitation likely contributed to, or initiated past declines or local extirpations throughout the upper Missouri River DPS (Vincent 1962). Currently, catch-and-release regulations are in effect for fluvial Arctic grayling in rivers in Montana. Under provisions of the Big Hole River Drought Management Plan, angling is closed when specific low flow and high temperature thresholds at the U.S. Geological Survey (USGS) Wisdom (#06024450) and USGS Melrose (#06025500) gaging stations are exceeded (Big Hole Watershed Committee 1997).

The MFWP has consistently monitored populations of fluvial Arctic grayling in the Big Hole River since the early 1980s. The experience of MFWP fishery biologists, combined with sampling restrictions when environmental conditions are stressful,

indicates negligible effects on fluvial Arctic grayling from scientific and resource management sampling. In the Big Hole River, overall threats to fluvial Arctic grayling from overutilization are not significant compared to those posed by direct alteration of habitat.

### **3) Disease, competition, or predation.**

Arctic grayling are resistant to whirling disease (Hedrick et al. 1999), but are susceptible to bacterial kidney disease (BKD). However, BKD tends to affect captive rather than wild populations (Myers et al. 1993; Peterson 1997).

Predation and/or competition with nonnative trout is thought to limit fluvial Arctic grayling in some situations (Kaya 1992a). Nonnative brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), and brown trout (*Salmo trutta*) are well-established with locally abundant populations throughout the upper Missouri River drainage including the Big Hole River. Research on competition between fluvial Arctic grayling and non-native brook trout found little evidence that brook trout negatively affected microhabitat use or growth of juvenile (age-1) hatchery-reared and wild fluvial Arctic grayling (Byorth and Magee 1998). However, further studies are necessary to determine whether competition or predation occur at other life stages or with brown or rainbow trout. Arctic grayling may have particular difficulty coexisting with brown trout (Kaya 2000). Overall, the decline of fluvial Arctic grayling in the upper Missouri River coinciding with encroachment by nonnative trout (Vincent 1962; Kaya 1990, 1992a, 2000), and the difficulty in reestablishing fluvial Arctic grayling populations where nonnatives are present (Kaya 1992b) provide circumstantial evidence of threats from nonnative trout.

Piscivorous American white pelican (*Pelecanus erythrorhynchos*), bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), great blue heron (*Ardea herodias*), and belted kingfisher (*Ceryle alcyon*) are seasonally present in Big Hole River valley, and can be effective fish predators. However, there are no data demonstrating these avian species are having a negative impact on fluvial Arctic grayling populations in the Big Hole River. These species are native to Montana (Montana Bird Distribution Committee 1996), and presumably have historically coexisted with fluvial Arctic grayling in the Big Hole River.

### **4) The inadequacy of existing regulatory mechanisms.**

State and Federal natural resource agencies in Montana have been monitoring the current population status of fluvial Arctic grayling and have been actively involved in conservation and restoration activities. However, despite the attention and protections fluvial Arctic grayling receive since they are a candidate species for listing under the ESA, there are no specific Federal laws currently in place to protect fluvial Arctic grayling in Montana. Montana considers fluvial Arctic grayling a

“Species of Special Concern,” but this designation does not confer any particular protection for the species.

The MFWP instituted catch-and-release angling restrictions for fluvial Arctic grayling and increased possession limits for nonnative brook trout, and also have a policy to suspend recreational angling under drought conditions in reaches where water temperatures in the Big Hole River exceed 70°F for more than 8 hours per day for 3 consecutive days (MFWP Fishing Closure Policy, Headquarters, Helena, Montana). The Big Hole River is currently being evaluated under section 303(d) of the Federal Clean Water Act. Moreover, much of the Big Hole River system may soon be subject to water rights adjudication under Montana State water law.

#### **5) Other natural or manmade factors affecting its continued existence.**

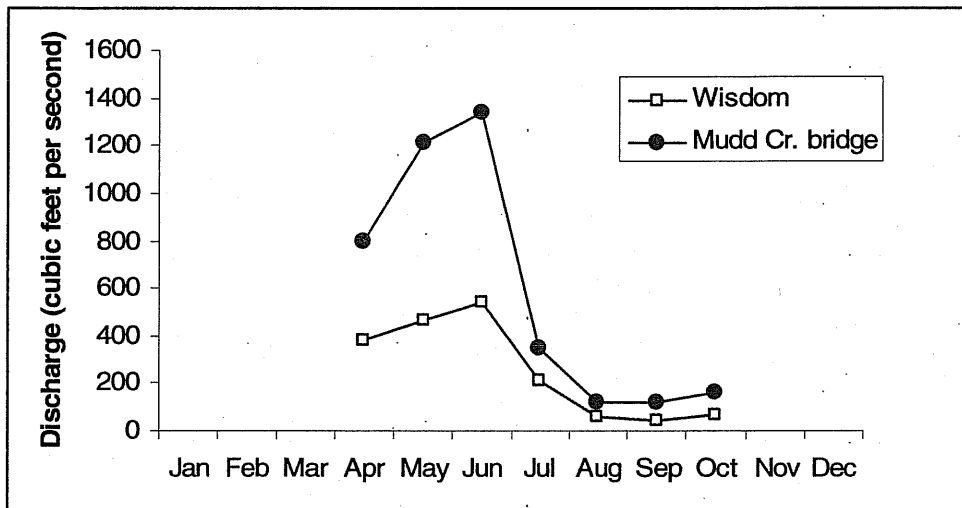
Drought is a significant threat to well-being of fluvial Arctic grayling populations in the upper Missouri River basin. Southwestern Montana has experienced a severe drought since 1999, which has exacerbated the impacts of water withdrawals in the upper Missouri and Big Hole River basin. Reductions in populations of fluvial Arctic grayling and nonnative trout in the Big Hole River appear to coincide with periods of drought (Magee and Lamothe 2003, 2004). Climate change (global warming) is predicted to result in habitat loss and

fragmentation for salmonid species in the Rocky Mountains (Keleher and Rahel 1996), and should place further thermal constraints on fluvial Arctic grayling in the Big Hole River (Lohr et al. 1996) if other habitat conditions do not improve.

The fluvial Arctic grayling in the Big Hole River are possibly subject to environmental and genetic problems typically observed in small populations. The importance of demographic uncertainty, environmental uncertainty, natural catastrophes, and genetic uncertainty on population dynamics all increase with decreasing population size (Shaffer 1987). Fluvial Arctic grayling in Montana appear to have low genetic variability compared to populations elsewhere (Everett 1986; Redenbach and Taylor 1999). Thus, effects from random survival and reproduction of individuals (demographic uncertainty); variation in climate, food resources, competitors, parasites (environmental uncertainty); random occurrence of floods and drought (natural catastrophes); and genetic drift (genetic uncertainty) may threaten the long-term persistence of this population.

### **C. Hydrology**

Monthly hydrographs for two locations in the upper watershed demonstrate that snowmelt runoff begins in April and generally peaks in June (Figure 6). Discharge declines throughout the summer as the snowpack melts. Baseflow conditions are generally reached in late summer and fall, when river flows are affected by discharge of ground water to the surface-water system (Marvin and Voeller 2000).



**Figure 6.** Hydrograph for two locations in the upper Big Hole River watershed. Points are the mean monthly discharge at Wisdom (1998-2004) and at the Mudd Creek Bridge (1998-2004). Gages are operated only during the months of April-October.

Human activities have compromised the structure and function of the Big Hole River in the proposed project area. The predominant land use in the upper Big Hole watershed and the proposed project area is irrigated agriculture, specifically hay production and livestock pasture. Flood (surface) irrigation is almost exclusively used to irrigate hay fields and pastures in the proposed project area. These land-use activities have been occurring in the area for more than a century, and have resulted in significant changes to the system's natural hydrology. Irrigation withdrawals, in concert with effects of drought, have attenuated high-flow events and lowered base flow conditions. The TMDL assessment in the upper Big Hole River concluded that flood irrigation during summer months influenced the dewatering that frequently occurs in the river upstream of Wisdom (Upper Big Hole River TMDL 2003). The upper Big Hole River is listed as "impaired" under the State of Montana's 303(d) list, citing flow alterations and thermal modifications.

Flow alterations and dewatering are implicated in the poor reproductive success of fluvial Arctic grayling in the upper mainstem Big Hole River. These alterations to the natural system likely reduce the survival and growth of all age classes of fluvial Arctic grayling by limiting their ability to move between necessary habitats and by causing acute or chronic thermal stress. Overall, reduced instream flows tend to coincide with a reduced abundance of fluvial Arctic grayling in the upper Big Hole River (Magee and Lamothe 2003, 2004). Thermal conditions stressful to salmonid fishes such as fluvial Arctic grayling frequently occur in the mainstem Big Hole River during summer months (e.g., Magee and Lamothe 2003, 2004).

The available data indicates that the flood irrigation techniques used in the project area are relatively inefficient and that some fields and pastures are over-irrigated (MFWP et al. 2005, 2006 and references therein). The proposed Agreement generally concludes that reducing the magnitude of these diversions would improve overall hydrologic conditions and benefit

fluvial Arctic grayling. There is some evidence that ground-water recharge and return flows from these irrigation practices may influence late summer and fall streamflows in some locations, but losses from evapotranspiration can be significant (Marvin and Voeller 2000). Moreover, some irrigation return flows may result in thermal or nutrient loading. Studies are ongoing to better characterize the interactions between irrigation diversions, groundwater recharge, irrigation return flows and surface-water discharge (M. Roberts, MDNRC, pers. comm.). However, the current weight of the evidence indicates the upper Big Hole River is plagued by chronic dewatering and that reducing the amount of water diverted for irrigation would improve habitat conditions for fluvial Arctic grayling. The proposed Agreement outlines changes (conservation measures) designed to promote a more “natural” hydrograph in the system to restore fluvial processes of erosion and deposition while providing instream flows that would promote recovery of fluvial Arctic grayling.

Collectively, the hydrological template of the upper Big Hole River system has been affected by irrigation withdrawals and flood irrigation techniques that have been used for more than a century. In addition, the physical template of the river system has been affected by irrigation and land use practices related to historical agricultural practices including the installation of diversion structures that block fish movement, operation of irrigation ditches that inadvertently entrain fish, disturbance of streambeds to create “push up” irrigation diversions, and degradation of riparian zone communities by livestock or direct human manipulation.

#### **D. Vegetation**

Vegetation in the upper Big Hole River watershed is somewhat typical of higher-elevation locations of the Rocky Mountain ecoregion. The predominant vegetation types, by area, are evergreen forests (Table 2), primarily lodgepole pine and mixed alpine forest. These types, plus other types of coniferous forest are the predominant vegetation types at higher elevations in the watershed. At mid-elevations, coniferous forest gives way to mixed forest and sagebrush or dry-land shrubs, while sagebrush, grasslands, and irrigated fields and pastures predominate at lower-elevation sites characteristic of valley bottoms (Upper Big Hole River TMDL 2003). The proposed project area is on non-Federal lands in the upper watershed, which are primarily the valley bottoms or lowlands adjacent to the Big Hole River and its tributaries. Two independent datasets were used to more specifically characterize land cover and vegetation in the project area--the USGS' National Lands Cover Dataset and the 1998 GAP analysis for Montana (Tables 3 and 4, respectively). Both datasets indicate the majority of the project area is grassland and shrubland, with coniferous forests, irrigated agricultural lands (agriculture or pasture/hay), wetlands, and riparian zones comprising lesser, but significant, amounts (Tables 3 and 4).

Existing land use has resulted in changes to plant communities in the project area. Widespread loss of riparian vegetation has been observed in the project area, primarily as a result of livestock grazing or direct removal (Lamothe and Magee 2003; Upper Big Hole River TMDL 2003). Anecdotal reports suggest that over-irrigation has converted areas of sage or dry-land vegetation to wetland-type species including sedges and forbs (Upper Big Hole River TMDL 2003). Two sensitive plant species, Lemhi beardtongue and Idaho sedge, occur in the project area (Table 5).

**Table 2.** Land use categories for the 1.8-million acre Big Hole River watershed based on the USGS' 1:250,000 scale Land Use/Land Cover dataset.

LAND USE*	ACRES (% of total)
Evergreen Forest	914,273 (51.0%)
Grass Rangeland	522,512 (29.2%)
Crop/Pasture	75,345 (4.2%)
Brush Rangeland	70,014 (3.9%)
Wetland	58,617 (3.3%)
Mixed Rangeland	53,380 (3.0%)

\*Land use categories representing <1% of the total watershed area include (total acres): Exposed Rock (15,038), Shrub Tundra (9,607), Deciduous Forest (9,170) Transportation/Utilities (1,763), Lakes (1,518), Mine/Quarry (498), Other Agriculture (435), Mixed Tundra (320), Mixed Urban (184), Other Urban (165), Residential (128), Reservoir (47) and Commercial (6). (Data from: State of Montana NRIS database)

**Table 3.** Land cover in the proposed project area within the upper Big Hole River watershed based on the USGS' National Lands Cover Dataset.

LAND COVER DESCRIPTION*	ACRES (% of total)
Grasslands/Herbaceous	237,160 (61.2%)
Shrubland	74,778 (19.3%)
Evergreen Forest	26,881 (6.9%)
Pasture/Hay	24,634 (6.4%)
Woody Wetlands	13,280 (3.4%)
Emergent Herbaceous Wetlands	6,822 (1.8%)

\*Land use categories representing <1% of the total project area include (total acres): Open Water (1,582), Deciduous Forest (1,470), Small Grains (515), Bare Rock/Sand/Clay (189), Row Crops (49), Commercial/Industrial/Transportation (20), Mixed Forest (16), Transitional (11.6), Perennial Ice/Snow (9.6), Low Intensity Residential (6) and Urban/Recreational Grasses (<1). (Data from: NLCS dataset and cover analysis conducted by Montana Natural Heritage Program on 8-11-05)

**Table 4.** Land cover in the proposed project area within the upper Big Hole River watershed based on the 1998 GAP analysis of land cover in Montana.

LAND COVER DESCRIPTION*	ACRES (% of total)
Dry Shrubland	112,808 (28.9%)
Upland Grasslands	102,200 (26.2%)
Agricultural	89,878 <sup>†</sup> (23.0%)
Conifer Forest	28,532 (7.3%)
Moist Shrubland	25,975 (6.7%)
Mixed Conifer Forest	11,956 (3.1%)
Mixed Riparian	8,099 (2.1%)

\*Land use categories representing <1% of the total project area include (total acres): Mixed Deciduous-Aspen (3,345), Mixed Deciduous-Conifer Forest (2,602), Exposed Rock (1,615), Water (1,145), Mixed Moist Forest (1,012), Barren Land (576), Alpine Areas (415), Barren Alpine Tundra (301), Cloud Shadow (<1), and Cloud (<1).

<sup>†</sup> Approximately 89,537 acres of the agricultural lands are irrigated.

(Data from: 1998 Montana GAP analysis and land cover analysis conducted by USDA Natural Resources Conservation Service on 8-11-05)



**Table 5.** List of sensitive and threatened plant and vertebrate animal species present in the proposed project area. All species listed here are considered Species of Concern in Montana, but have variable status under different listing authorities.

COMMON AND SCIENTIFIC NAME	ESA STATUS	USFS STATUS	BLM STATUS
<b>Plants</b>			
Lemhi Beardtongue ( <i>Penstemon lemhiensis</i> )	-	Sensitive	Sensitive
Idaho Sedge ( <i>Carex idaho</i> )	-	Sensitive	Sensitive
<b>Animals (vertebrate)</b>			
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	Threatened (potential delisting)	Threatened	Special Status
Arctic Grayling - Upper Missouri River Fluvial ( <i>Thymallus arcticus</i> )	Candidate	-	Special Status
Greater Sage-grouse ( <i>Centrocercus urophasianus</i> )	-	Sensitive	Sensitive
Gray Wolf ( <i>Canis lupus</i> )	Threatened (nonessential experimental)	Threatened	Special Status
Westslope Cutthroat Trout ( <i>Oncorhynchus clarki lewisi</i> )	-	-	Sensitive
Canada Lynx ( <i>Lynx canadensis</i> )	Threatened	Threatened	Special Status
Northern Goshawk ( <i>Accipiter gentiles</i> )	-	Sensitive	Sensitive
Great Gray Owl ( <i>Strix nebulosa</i> )	-	-	Sensitive

(Data from Montana Natural Heritage Program May 31, 2005)

## **E. Wetlands**

Wetlands are habitats on the interface between terrestrial and aquatic systems where the water table is at or near the surface, soils are often saturated with or covered by shallow water and vegetation communities are adapted to saturated soil conditions (Cowardin et al. 1979). Wetlands are ecologically significant and diverse habitats, providing important rearing and refuge habitat for wildlife species and influencing physical and hydrologic processes such as erosion, runoff, and the filtering of nutrients and minerals. The USGS 1:125,000 Land Use/Land Cover Dataset indicates there are approximately 58,617 acres of wetland habitat in the Big Hole River watershed, representing 3.3% of the total land area (Table 2). The National Lands Cover Dataset indicates there are approximately 20,103 combined acres of woody and emergent herbaceous wetlands in the ~382,000-acre proposed project area, which represents 5.2% of the total area (Table 3).

## **F. Fisheries**

The Big Hole River watershed contains a moderately diverse mix of native and introduced fish species from five families (Table 6). Native species known or believed to occupy waters in the proposed project area include three species of sucker (longnose, mountain, white), mottled sculpin, longnose dace (a minnow), burbot (ling), and three salmonids (westslope cutthroat trout, fluvial Arctic grayling and mountain whitefish) (Oswald 2005). Lake trout are native to the watershed, but only occur in Twin Lakes that is outside the proposed project area.

Westslope cutthroat trout are native to the watershed and considered a Species of Special Concern by the State of Montana (Tables 5 and 6). They are found in at least 85 streams in the watershed, but are generally rare (Montana Fisheries Information System [MFISH], Montana Natural Resources Information System [Montana NRIS] and MFWP; ><http://maps2.nris.state.mt.us/WIS/MFISHApp><). The species range of westslope cutthroat trout has been reduced factors similar to those which have affected fluvial Arctic grayling, namely habitat loss and degradation, and interactions with introduced salmonid species (Shepard et al. 2003). Westslope cutthroat trout also hybridize with introduced rainbow trout and other subspecies of cutthroat trout. Westslope cutthroat trout may occur in some waters in the proposed project area and may even be present in the same stream as fluvial Arctic grayling. However, westslope cutthroat trout are rarely found in the mainstem Big Hole River and tend to be found in higher-elevation tributary streams, whereas fluvial Arctic grayling (when present) occupy the lower-reaches of tributary streams and mainstem river habitats. Thus, even when the two species are present in the same stream their actual distributions seldom overlap. As described earlier, fluvial Arctic grayling are a species of special concern by the State of Montana, and the DPS that includes the Big Hole River fluvial Arctic grayling population is a candidate under the ESA (Table 5).

Introduced salmonid species support the important recreational fishery in the Big Hole River (Oswald 2005). Brook trout are most abundant, followed by brown trout and rainbow trout. Brown trout are arguably the single-most important game species in the river and are present in the project area, though they are much less abundant than brook trout. Introduced rainbow trout and Yellowstone cutthroat trout have hybridized with native westslope cutthroat trout at some locations in the watershed (Table 6). Introduced golden trout occur in mountain lakes outside the project area (MFISH database). Non-game introduced species present in the Big Hole River include reidside shiner and common carp (*Cyprinus carpio*), but both are thought to be rare (MFISH database).

The tailed frog (*Ascaphus montanus*) and Columbia spotted frog (*Rana luteiventris*) are present in the upper Big Hole Watershed, though the tailed frog is less likely to occur in the project area because it tends to occupy higher elevation habitats and favors small, cold mountain streams (Montana Natural Heritage Program - <http://nhp.nris.state.mt.us>). A Montana Natural Heritage Program database search did not detect any sensitive or threatened species of amphibians in the proposed project area.

**Table 6.** Fish species occurrence in the Big Hole River watershed in Beaverhead and Deerlodge Counties, Montana.

FAMILY	SPECIES NAME	NATIVE OR INTRODUCED	BELIEVED PRESENT IN PROPOSED PROJECT AREA
Catostomidae	Longnose Sucker ( <i>Catostomus catostomus</i> )	N	P
Catostomidae	Mountain Sucker ( <i>Catostomus platyrhynchus</i> )	N	P
Catostomidae	White Sucker ( <i>Catostomus commersoni</i> )	N	P
Cottidae	Mottled Sculpin ( <i>Cottus bairdi</i> )	N	P
Cyprinidae	Longnose Dace ( <i>Rhinichthys cataractae</i> )	N	P
Cyprinidae	Redside Shiner ( <i>Richardsonius balteatus</i> )	I	
Gadidae	Burbot ( <i>Lota lota</i> )	N	P
Salmonidae	Fluvial Arctic Grayling ( <i>Thymallus arcticus</i> )	N	P
Salmonidae	Brook Trout ( <i>Salvelinus fontinalis</i> )	I	P
Salmonidae	Brown Trout ( <i>Salmo trutta</i> )	I	P
Salmonidae	Golden Trout ( <i>Oncorhynchus aguabonita</i> )	I	
Salmonidae	Lake Trout ( <i>Salvelinus namaycush</i> )	N	
Salmonidae	Mountain Whitefish ( <i>Prosopium williamsoni</i> )	N	P
Salmonidae	Rainbow Trout ( <i>Oncorhynchus mykiss</i> )	I	P
Salmonidae	Westslope Cutthroat Trout ( <i>Oncorhynchus clarki lewisi</i> )	N	P
Salmonidae	Westslope cutthroat trout X Rainbow trout hybrid	I	
Salmonidae	Westslope cutthroat trout X Yellowstone cutthroat trout X Rainbow trout hybrid	I	
Salmonidae	Yellowstone Cutthroat Trout ( <i>Oncorhynchus clarki bouvieri</i> )	I	
Salmonidae	Yellowstone Cutthroat Trout X Westslope Cutthroat trout hybrid	I	

Data from Montana MFISH ><http://maps2.nris.state.mt.us/WIS/MFISHApp><; note: The MFISH database search for the Big Hole River indicated common carp *Cyprinus carpio* were present, but carp were not detected when the search was constrained to Beaverhead and Deerlodge Counties so they were not included in the above table)

## G. Wildlife

A handful of at risk wildlife species occur in the project area. The Montana Natural Heritage Program database indicates that three ESA-listed wildlife species (bald eagle, lynx, and gray wolf) and two sensitive bird species (great gray owl and greater sage grouse) may be present in the proposed project area (Table 5). Bald eagle is a federally threatened species is occasionally sighted in the proposed project area (Mike Roberts, MDNRC, pers. comm.). However, USFWS records indicate that the nest location for this territory (#38007) is located downstream and outside of the actual project area (USFWS 2005), so use of the project area may be limited to occasional foraging. The USFWS is currently considering whether bald eagle should be delisted (USFWS 1999).

Gray wolf is a federally threatened species and present in the project area. Wolves in the Big Hole River Valley are part of the "Battlefield" pack, and the pack is a component of a "non-essential experimental" population (under section 10(j) of the ESA) in the Central Idaho Recovery Area (USFWS et al. 2005). At least 10 wolves were believed to belong to this pack as of December 2004 (USFWS et al. 2005), but since that time the entire pack has been lethally controlled because of wildlife depredations (Joe Fontaine, USFWS, pers. comm.). Wolves designated as nonessential experimental that are not within units of the NPS or National Wildlife Refuge systems but are within the boundaries of the nonessential experimental population area are treated as proposed species for section 7 purposes. As such, Federal agencies are only required to confer with USFWS when they determine that an action they authorize, fund, or carry out "is likely to jeopardize the continued existence" of the species.

Lynx occur in the Big Hole River watershed, and generally prefer higher-elevation, forested montane habitats (McKelvey et al. 2000). The Montana Natural Heritage Program database search of "at risk" wildlife species indicates that lynx have been observed in the project area (Table 5), but such occurrences seem unlikely or infrequent because the majority of the project area is grassland or rangeland (Tables 3 and 4). Sensitive bird species in the project area include northern goshawk and greater sage grouse (Table 5).

The project area is large and bounded by large tracts of public lands and comparatively pristine mountain habitats, so various species of non-sensitive game and non-game wildlife may be abundant in the area. Big-game species that likely occur in the project area include whitetail deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), antelope (*Antilocapra americana*), elk (*Cervus elaphus*), moose (*Alces alces*), and black bear (*Ursus americanus*) (distribution inferred from species-specific hunting areas from MFWP "Plan a Hunt" database ><http://fwp.state.mt.us/hunting/planahunt/default.aspx><). Upland game bird species that likely occur in the project area include sage grouse (*Centrocercus urophasianus*), spruce grouse (*Falcipennis canadensis*), ruffed grouse (*Bonasa umbellus*), and Hungarian (gray) partridge (*Perdix perdix*). Carnivorous mammals including coyote (*Canis latrans*), red fox (*Vulpes vulpes*), bobcat (*Felis rufus*) and mountain lion (*Felis concolor*) may inhabit or occasionally enter portions of the project area (Montana Natural Heritage Animal Field Guide, <http://nhp.nris.state.mt.us/animalguide>). Mammal species

associated with aquatic habitats, such as beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), northern river otter (*Lutra canadensis*), and a variety of vole species (Family *Muridae*) may occur in the project area. Bird species including osprey (*Pandion haliaetus*), white pelicans (*Pelecanus erythrorhynchos*), great blue heron (*Ardea herodias*), belted kingfisher (*Ceryle alcyon*), and various species of waterfowl (Family *Anatidae*) and owls (Family *Strigidae*) may be found in the project area.

## **H. Social Considerations**

### **(1) Cultural and Historical Resources**

The Big Hole River watershed is known to contain significant sites of archaeological, cultural and historic significance. For example, Native Americans historically inhabited the area, the Corps of Discovery (i.e., Lewis and Clark expedition) passed through the valley, and the Big Hole National Battlefield is located in the northwest corner of the watershed. The USFWS consulted with the Montana State Historical Preservation Office (Montana SHPO) in an attempt to characterize sites that may be present in the project area of the proposed Agreement. Because of the large number of Township-Range-Section plots in the proposed project area, the search was extended to the entire Big Hole River watershed for logistic simplicity given the structure of the Montana NRIS database. Thus, the database search was conducted over the 1.8-million acre watershed and included parts of six counties. The proposed project area represents only about 21% (380,000 acres) of this area. This search returned over one thousand historic or archaeological sites (Table 7), but over 60% of these sites were on Federal lands and would be outside the purview of the proposed Agreement. Approximately 185 sites (17.4% of total) potentially affected by the proposed Agreement were identified on private lands if they were located within the project footprint (Table 8).

These 185 sites include a variety of sites related to Native American culture, including lithic scatters and tipi rings; and Euro-American settlement, including homesteading, mining, transportation and agriculture (Table 8). It is not known which of these specific sites are present in the proposed project area, but any ground-disturbing activities to be implemented under the proposed Agreement or any site-specific plan would require an individual Montana SHPO consultation and/or survey (as necessary) to ensure compliance with applicable State and Federal regulations (i.e., National Historic Preservation Act [NHPA]).



**Table 7.** Results of a Montana SHPO search of previously recorded historic or archaeological sites within the 1.8-million acre (2,800 mi<sup>2</sup>) Big Hole River watershed which includes portions of Beaverhead (1,974 mi<sup>2</sup>), Deerlodge (321.3 mi<sup>2</sup>), Silver Bow (285.3 mi<sup>2</sup>), Madison (216.4 mi<sup>2</sup>), Ravalli (1.0 mi<sup>2</sup>), and Granite (0.2 mi<sup>2</sup>) Counties, Montana. The project area of the proposed action is only about 21% (380,000 acres) of the search area (1.8 million acres).

OWNERSHIP	NUMBER OF SITES	% BY OWNERSHIP
BIA	1	0.1
BLM	207	19.5
BLM and Other	27	2.5
Bureau of Reclamation	1	0.1
Combination	56	5.3
USFS	393	37.0
Montana Dept of Transportation (Other)	1	0.1
NPS	26	2.4
National Wildlife Refuge	2	0.2
No Data	67	6.3
Other	9	0.8
Other State Owned	2	0.2
Private	185	17.4
State Owned	85	8.0
<b>Total</b>	<b>1,062</b>	<b>100</b>

(Data from the NRIS at <http://nris.state.mt.us/>)

**Table 8.** Recorded historical or archaeological sites (N=185) identified by Montana SHPO as being located on private lands within the 1.8-million acre Big Hole River watershed, Montana.

TYPE OF SITE	NUMBER
Cribbed Log Occupation Structure	8
Firehearth or Roasting Pits FCR	4
Historic Agriculture	2
Historic Architecture	1
Historic Dug-Out	1
Historic Euro-American Site	18
Historic Homestead/Farmstead	11
Historic Indian Agency	1
Historic Irrigation System	58
Historic Log Structure	1
Historic Mining	12
Historic Placer Mine	1
Historic Railroad Building/Structure	1
Historic Railroad Stage Route Travel	4
Historic Reclamation	1
Historic Residence	3
Historic Stock Raising	4
Historic Timber Harvesting	4
Historic Trash Dump	1
Historic Vehicular/Foot Bridge	3
Lithic Scatter	24
Other	1
Pictograph	1
Processing Area	1
Rock Alignment(s)	2
Rock Cairn(s)	5
Rock Shelter or Cave	1
Rock Structure(s)	1
Surface Stone Quarry	2
Tipi Ring	6
Vision Quest Structure	1
Workshop	1

## (2) Local Communities and Their Economies

The proposed project area is rural, with an economy, lifestyle and culture centered on traditional ranching. Population density in the Big Hole River watershed and proposed project area is very low. Beaverhead County, which contains over 80% of the project area, has a population density of 1.66 people per square mile, whereas Deer Lodge County averages 12.78 per square mile (data from 2000 Census, Montana Census and Economic Indicator Center [Montana CEIC]). Fewer than 10,000 people inhabit each of these two counties (Table 9), and fewer than 1,000 inhabit the Big Hole River watershed. The two towns in the project area, Jackson and Wisdom (Figure 5), each have fewer than 200 residents (Montana CEIC, Montana NRIS), and the human population density of much of the project area is <0.5 per square mile (Montana NRIS).

**Table 9.** Human Population for Counties included in the project area.

<b>CRITERION</b>	<b>BEAVERHEAD</b>	<b>DEERLODGE</b>
Total Population	9,202	9,417
Urban Population	4,301 (46.7%)	6,279 (66.7%)
Rural Population	4,901 (53.3%)	3,138 (33.3%)
Rural Farm Population	864 (17.6%)	113 (3.6%)
Rural Nonfarm Population	4,037 (82.4%)	3,025 (96.4%)

(Data from Montana Department of Commerce)

The rural nature of the project area also is indicative of conditions in the constituent counties. Over half of Beaverhead County is considered rural, compared to about one third of Deerlodge County. Over 62% of Deerlodge County's population is in the "urban" center of Anaconda, and the Big Hole Valley constitutes only 1% of the total estimated population (Beaverhead-Deerlodge Forest Plan Revision >[www.fs.fed.us/r1/b-d/forest\\_plan/revision/reports\\_documents/social/index.htm](http://www.fs.fed.us/r1/b-d/forest_plan/revision/reports_documents/social/index.htm)<). About 36% and 29% of the total land areas in Beaverhead and Deerlodge Counties, respectively, are classified as being used for agriculture (Table 10). About 29% of the entire Big Hole River watershed is classified as being used for agriculture (Montana NRIS), and the 1998 GAP analysis dataset indicates there are approximately 89,500 irrigated acres in the project area (Table 4). Farms are large, averaging at least 1,200 acres in the two counties (Table 10), and the majority of these agricultural lands are used for livestock grazing (Table 11). For example, 205 of the 421 farms in listed in Beaverhead County are involved in beef cattle production (Montana Department of Labor and Industry). Similarly, about 79% of private lands in the Big Hole River watershed are used for livestock grazing (Montana NRIS).

As mentioned earlier, much of the watershed is under public ownership. Approximately 67% of the watershed is owned by the Federal government (58% USFS, 9.4% BLM, and 0.04% NPS) and 3.4% is owned by the State of Montana, whereas the remaining 28.9% is privately owned. These figures for the watershed also are characteristic of the counties at large, where between 30-40% of the land area is in private ownership and the largest public ownership entities are the Federal government (especially the USFS) and State of Montana (Table 12).

**Table 10. Agricultural Lands in Beaverhead and Deerlodge Counties, Montana.**

STATISTIC	BEAVERHEAD	DEERLODGE
Number of Farms	421	109
Land in Farms (acres) and percent of total land area	1,279,031 (36%)	134,997 (29%)
Average Farm Size (acres)	3,038	1,239
Total Land Area (acres)	3,547,076	471,666

(Data from 2002 Census of Agriculture – Montana Agricultural Statistics Service)

**Table 11. Beaverhead and Deerlodge Counties Agricultural Land Use.**

AGRICULTURAL USE TYPE*	AREA (%) OF AGRICULTURAL USE TYPE	
	BEAVERHEAD	DEERLODGE
Grazing	928,477 (83.4%)	152,669 (60%)
Irrigated	128,554 (11.5%)	10,007 (3.9%)
NonQualAg	17,083 (1.5%)	23,422 (9.2%)
WildHay	15,771 (1.4%)	4,691 (1.8%)
Timber	13,766 (1.2%)	63,754 (25%)
FallowCrop	10,213 (0.9%)	-

\*Abbreviations: Grazing = Land area of the parcel in native or domestic range used to support livestock; Irrigated = Land area of the parcel that is irrigated the majority of the time; NonQualAg = Land area under one ownership that falls into the acreage range of 2-160 acres for which no agricultural application has been approved; WildHay = Land area where either native grass or alfalfa is cut a majority of years for hay; Timber = Acres of the parcel in forest land exceeding 15 contiguous acres that is capable of producing timber that can be harvested in commercial quantity; and FallowCrop = Land area of the parcel cropped and left fallow in alternate years. (Data from: State of Montana NRIS database).

**Table 12. Land ownership or designation for Beaverhead and Deerlodge Counties, Montana.**

OWNER	ACRES IN OWNERSHIP OR DESIGNATION (% OF TOTAL)	
	BEAVERHEAD	DEERLODGE
USFS	1,446,281 (39.8)	192,500 (38.5)
Private	1,117,269 (30.7)	205,484 (40.8)
BLM	678,535 (18.7)	8,230 (1.6)
State Government	375,000 (10.3)	70,801 (14.1)
Water*	9,464 (0.3)	301 (< 0.1)
Undetermined	4,131 (0.1)	10,337 (2.1)
Right of Way	1,840 (< 0.1)	2,414 (0.5)
USFWS	1,590 (< 0.1)	
Local Government	1,197 (< 0.1)	4,373 (0.9)
U.S. Government	882 (< 0.1)	8,351 (1.7)
Bureau of Reclamation	784 (< 0.1)	-
NPS	665 (< 0.1)	444 (< 0.1)

\* Area of surface waters in each county. (Data from: Montana NRIS database)

The importance of ranching in the project area is belied by the fact that Beaverhead County is the top cattle and calf-producing county in the State of Montana and second in cash receipts for livestock and livestock products (Montana Agricultural Statistics Service ><http://www.nass.usda.gov/mt/><). In contrast, Deerlodge County is ranked 53 (out of 56) for cattle production and cash receipts for livestock. Mining and mineral extraction are much more important economically for the Deerlodge County, as a whole, compared to Beaverhead County. Recreation also is important in the Big Hole River, with fishing, hunting and rafting playing significant economic roles in the area.

Beaverhead County has slightly higher per capita income and lower unemployment rates compared to Deerlodge County, Montana. In 2003 Beaverhead had a per capita personal income of \$24,204, which ranked 16th in the State and was 95% of the State average of \$25,406, and 77% of the national average, \$31,472. In 2003 Deer Lodge had a per capita personal income of \$21,417, which ranked 34th in the State (84% of average) and 68% of the national average (data from U.S. Department of Commerce, Bureau of Economic Analysis - <http://www.bea.doc.gov>). Data from Montana Department of Labor and Industry indicates an unemployment rate of 5.5% and 7.8% for Beaverhead and Deerlodge Counties.

### **(3) Recreation**

The large areas of public lands coupled with abundant fishery and wildlife resources make the Big Hole River Valley a popular recreational destination. However, much of this recreation is dispersed and generally includes fishing, hunting, camping, hiking, horseback riding, off-highway vehicle riding (all seasons), rafting, snowshoeing, cross-country skiing, and wildlife viewing. With the exception of fishing and rafting, much of these activities occur in the basin's uplands that lie within the Beaverhead-Deerlodge National Forest (BDNF) or to a lesser extent on lands managed by the BLM. Because the project area includes non-Federal lands mostly owned by private citizens or held by ranches, much of the access for these activities requires landowner consent. However, Montana State law permits public access of river and streams for recreational purposes.

The Big Hole River is a nationally-recognized trout fishery for brown trout and rainbow trout, and the lower portions of the river receive heavy use from both private anglers and outfitters. The MFWP has developed a recreation management plan for the Big Hole River to better regulate recreational and pressure on the lower river (><http://fwp.state.mt.us/fishing/regulations/proposedbiennialrule.html><). Recreational angling does occur in the waters of the proposed project area, but the most significant fishery, in terms of angler visits and economic importance, occur mostly outside and downstream from the proposed project area. Overall, recreational angling does appear to play an important economic role in the watershed (e.g., Upper Big Hole River TMDL 2003).

Big game hunting, especially for elk, is a popular fall activity and does occur on private lands in the project area. The Big Hole National Battlefield, located outside the proposed project area, is perhaps the single-most popular tourist destination in the upper Big Hole River Watershed, drawing up to 60,000 annual visitors.

#### **IV. ENVIRONMENTAL CONSEQUENCES**

##### **A. General Differences Among the Alternatives**

The general land use would be similar across the three alternatives in that livestock ranching would remain the primary activity. The main difference among the alternatives would be the certainty and extent to which existing land and water management practices would be modified to reduce or eliminate threats to fluvial Arctic grayling. These modified practices would constitute "conservation measures" implemented to benefit fluvial Arctic grayling that also may affect other components of the environment. Assuming similar types of conservation measures would be implemented under all alternatives, the differences in environmental consequences would depend on the anticipated level of private landowner involvement, which is expected to vary significantly among the alternatives.

Implementation of conservation measures under Alternative A (No action) is highly uncertain because the absence of ESA regulatory assurances for implementing these measures may be a disincentive for landowners concerned with having an ESA-listed species in waters adjacent to their property. In contrast, both Alternatives B and C involve an Agreement that would offer regulatory assurances to participants under an ESA section 10 permit and thus remove this disincentive. Under Alternative A it is uncertain whether conservation and restoration projects undertaken by the various stakeholder groups (agencies and grassroots organizations) would be sufficiently coordinated or implemented at a scale necessary to benefit fluvial Arctic grayling in a timely fashion. Conservation measures would be systematically implemented under both B and C, but the scope of potential participation is much greater for B because of the larger proposed project area. In general, any of the alternatives may involve some level of ground disturbance depending on the specific actions taken to implement conservation measures on a given land area (see Table 1). The alternatives are expected to influence, to varying extents, the following environmental attributes: fluvial Arctic grayling, hydrology, vegetation, wetlands, fishes, wildlife, cultural resources, local communities and economies, and recreation. None of the alternatives are anticipated to influence the local climate, air quality, geologic or topographic features, general land use, or aesthetics. Overall, the Alternatives B and C are expected to result in no effect or a positive effect for fluvial Arctic grayling, hydrology, vegetation, wetlands, fishes, wildlife, cultural resources, local communities and economies, and recreation; while the status quo or piecemeal approach described under Alternative A would continue to have negative effects on some attributes. The following sections describe the effects of each alternative on these ecological attributes, and a summary table follows the detailed analysis (Table 13). A summary of the MEPA significance criteria for the proposed action is presented in Table 14.



## **B. Fluvial Arctic Grayling**

### **Alternative A**

The effect of Alternative A (No Action) would appear to be inherently negative for fluvial Arctic grayling where environmental conditions create a conflict over water use and tend to perpetuate the same land and water use practices that have led to the decline of fluvial Arctic grayling in the Big Hole River. A suite of conservation measures could be implemented to address the effects of land and water use on fluvial Arctic grayling (e.g., Table 1), but the certainty that they would actually be implemented to the extent that fluvial Arctic grayling would benefit is comparatively low for two key reasons--lack of participation and piecemeal or inconsistent execution of measures. First, absent the ESA regulatory assurances provided under an Agreement, landowners would have little incentive to conserve fluvial Arctic grayling. There may, in fact, be an incentive to not conserve fluvial Arctic grayling in order to reduce the probability that an ESA-listed species would occupy waters adjacent to their property and result in land and water use restrictions. Second, while a number of State and Federal agencies have been involved to varying degrees in attempts to improve habitat conditions for fluvial Arctic grayling, the existing track record suggests that a collaborative and comprehensive approach would be more effective for fluvial Arctic grayling than an assortment of individual projects. While the agencies involved in developing the Agreement, watershed groups and some landowners have previously worked together to conserve fluvial Arctic grayling, the Agreement accelerates these efforts by creating a more systematic framework for dealing with threats to fluvial Arctic grayling, coordinating the technical skills of the various agencies, and generally using a more consistent set of guidelines to implement conservation measures.

The distribution of fluvial Arctic grayling in the Big Hole and the threats facing the species necessitate private landowner involvement in any viable conservation program. Without the implementation of proactive conservation measures on private lands, it is likely that fluvial Arctic grayling would continue to remain at low abundance and the threats facing the species would persist. The probability of an ESA listing for fluvial Arctic grayling would appear to be much greater under Alternative A compared to the other alternatives. While any projects implemented under Alternative A may improve local conditions for fluvial Arctic grayling, the certainty they would be implemented at a scale necessary to ensure the long-term persistence of fluvial Arctic grayling is not high. The no action alternative would appear to have overall negative consequences for fluvial Arctic grayling by largely perpetuating the status quo activities that led to the endangerment. However, these negative impacts do not achieve the level of significance under MEPA criteria (Table 14).

### **Alternative B**

The effect of Alternative B (Proposed Action) should be positive for fluvial Arctic grayling and lead to an increase in the abundance and distribution of fluvial Arctic grayling across the upper portion of the Big Hole River watershed. This alternative would involve the implementation of conservation measures on up to 380,000 acres of non-Federal land adjacent to or in proximity to the known or believed historical distribution of fluvial Arctic

grayling in the upper Big Hole River watershed. Existing land and water use, primarily related to cattle ranching and associated irrigation diversions, would be modified on enrolled lands to reduce threats to fluvial Arctic grayling associated primarily with habitat degradation and fragmentation resulting from reduced instream flows, non-functioning riparian habitats, physical barriers to fluvial Arctic grayling movement, and entrainment in irrigation ditches. Site-specific plans, consistent with the conservation requirements of the Agreement, would be developed on individual properties to implement any necessary conservation measures.

The probability that conservation measures would be implemented to the extent that the fluvial Arctic grayling population in the watershed would be secured and enhanced is greater for Alternative B compared with both A and C. The ESA regulatory certainty provided by the proposed Agreement would remove a disincentive to participate in fluvial Arctic grayling conservation because the enrolled landowners would receive assurances that their land and water use would not be modified above that described in the Agreement and their site-specific plans if fluvial Arctic grayling were later listed under the ESA. Private landowners who own and manage over 200,000 of the 380,000 acres in the project area have already indicated a willingness to participate in such an Agreement should it be approved. The implementation of conservation measures using a consistent set of guidelines would likely lead to a more efficient use of landowner and agency resources, a higher probability of proper implementation, and facilitate effective monitoring which can help direct further conservation efforts.

The conservation measures of the Agreement are designed to improve instream flows, conserve or restore riparian habitats, remove or mitigate for physical barriers to fluvial Arctic grayling movement and address population-level threats from entrainment.

Increased streamflows produced by implementation of Alternative B should be beneficial for fluvial Arctic grayling in the project area, because low streamflows and chronic dewatering as a result of irrigation diversions and overwatering are considered major threats to fluvial Arctic grayling. The Agreement proposes to improve streamflows through facilitating landowner compliance with water rights, upgrading irrigation structures to improve control over water diversion and delivery, repairing leaking head gates and water diversion structures, reducing irrigation withdrawals, improving irrigation ditches to reduce water losses, installing and maintaining off-stream livestock watering facilities, investigating and using alternative less water intensive livestock forage, and implementing a comprehensive irrigation water management plan developed by NRCS. The net result of these actions should be greater and more consistent instream flows throughout the project area compared to recent conditions, which should reduce the effects of low streamflow on the growth, survival and reproduction of fluvial Arctic grayling.

The conservation and restoration of riparian habitats proposed under Alternative B should be beneficial for fluvial Arctic grayling in the project area. Riparian habitats are transition zones between aquatic and terrestrial habitats, and exert a strong influence on the quantity and quality of fish habitat. Functional riparian habitats dissipate stream energy during floods, filter sediments and pollutants, facilitate ground-water recharge, cool streams by

shading, stabilize streambanks, maintain channel characteristics, promote floodplain development via deposition of sediments during overbank flows, and input woody debris, organic material, and terrestrial insects (Bjornn and Reiser 1991; Hunter 1991; Murphy and Meehan 1991; Prichard et al. 1998; Poole and Berman 2001). Much of the riparian area in the upper Big Hole River watershed is at risk or nonfunctional because of past and existing land use practices including livestock grazing in the riparian zone and direct removal of vegetation. Fluvial Arctic grayling in the project area use pool habitats associated with the overhanging vegetation in existing riparian areas (Lamothe and Magee 2003). Alternative B proposes to conserve and restore riparian habitats through implementation of prescribed grazing plans, exclusion fencing, more active livestock management, and off-channel livestock watering facilities that would reduce or eliminate cattle grazing (in riparian areas). The net result should be improved riparian conditions that would in turn positively influence instream habitat conditions (e.g., reduced water temperatures, greater frequency of deep pools, greater channel stability, reverse channel widening). These types of habitat improvements should directly benefit fluvial Arctic grayling.

The removal of physical barriers to fluvial Arctic grayling migration as proposed under Alternative B should be beneficial for fluvial Arctic grayling in the project area. The removal of migration barriers would allow fluvial Arctic grayling access to a greater portion of watershed, and increase access to seasonally-important habitats including spawning, feeding, wintering, and refuge. Fluvial Arctic grayling should thus respond, if previously blocked from these necessary habitats, through greater reproductive success, and increased survival and growth of all age classes.

The rescue of fluvial Arctic grayling entrained in irrigation ditches and the removal of population-level entrainment threats as proposed under Alternative B would be beneficial for fluvial Arctic grayling in the project area. Rescue (salvage) efforts, installation of fish screens at diversions determined to pose a population-level threat, and improvements to irrigation structures is expected to reduce the population-level threats to fluvial Arctic grayling from entrainment in irrigation ditches. Reducing or eliminating entrainment problems would lead to a direct increase in the number of fluvial Arctic grayling in natural stream channels where their survival and growth would presumably be greater.

Implementing the conservation measures described above (or under any of the alternatives) may involve ground disturbance in some cases (Table 1) and the handling of fluvial Arctic grayling. Short-term negative effects to fluvial Arctic grayling from disturbances may be possible in some situations. For example, installation of fish screens, new headgates, fish ladders, riparian fence construction and active riparian and channel restoration projects may result in temporary soil and substrate disturbance in or near streams. These sediment inputs may negatively affect the growth, survival and reproduction of fluvial Arctic grayling in adjacent habitats. These disturbances are expected to be short in duration, and are a necessary consequence of implementing conservation measures that would lead to long-term improvement to habitat conditions. The overall impact to fluvial Arctic grayling from this type of disturbance is presumed to be far less than if the conservation measures themselves were not implemented. Moreover, the draft Agreement states that these types of effects "...will be minimized by utilizing expert personnel wherever conservation measures require

construction or ground-disturbing activities, and by scheduling the work when streamflow and environmental conditions are suitable to reduce site impacts and sediment input” (p. 72, MFWP et al. 2005; and p. 80, MFWP et al. 2006 – final version of CCAA). Fluvial Arctic grayling would be handled during entrainment rescue efforts and monitoring required under Alternative B, and these actions have the potential to harm fluvial Arctic grayling. The MFWP’s use of electrofishing and fish handling protocols (Appendix 2), and the experience of the biologists involved in these actions are expected to minimize any negative effects. Under the expected duration of Alternative B, any minor negative effects to fluvial Arctic grayling are expected to be counteracted by the positive effects of the conservation measures. Therefore, the conclusion is that the net result would be beneficial to fluvial Arctic grayling.

Nonnative trout have been implicated in the replacement and displacement of grayling from waters outside the proposed project area. The actual threat to fluvial Arctic grayling from naturalized nonnative trout (brook, brown and rainbow trout) in the upper Big Hole River is not known, and the poor habitat conditions described above appear to be the most significant factors currently limiting fluvial Arctic grayling in the proposed project area.

Implementation of the conservation measures described under Alternative B should result in improved habitat conditions for most, if not all, cool- or cold-water fish species including nonnative trout. Thus, nonnative trout populations also may increase in the project area. This could indirectly lead to negative effects for fluvial Arctic grayling if increasing nonnative trout abundance leads to competition with and predation by nonnative trout. Alternative B does propose a mechanism to evaluate threats posed by nonnative trout, but does not obligate a specific management remedy. However, if the current physical habitat limitations to fluvial Arctic grayling recovery in the project area are not addressed, then the potential for future negative effects from nonnative trout may be irrelevant. Although an evaluation would be conducted for both Alternatives B and C, in effect there is no difference among any of the alternatives concerning the certainty whether management actions would be taken if it was later determined that nonnative trout were a threat to fluvial Arctic grayling in the project area.

Under the proposed action (Alternative B), impacts to fluvial Arctic grayling from land and water use activities related to livestock ranching would be addressed and mitigated at a large scale through the implementation of conservation measures described in the Agreement. The regulatory assurances provided to landowners (not included in Alternative A); the larger, more inclusive project area (compared to Alternative C); and the apparent landowner interest in the proposed action indicate a high probability of actual implementation and thus improved habitat conditions for fluvial Arctic grayling. Alternative B should be beneficial to fluvial Arctic grayling, producing an increase in the abundance and distribution of fluvial Arctic grayling across the project area and increasing the probability of long-term persistence of fluvial Arctic grayling in the Big Hole River.

## Alternative C

The effect of Alternative C (limited umbrella Agreement) should be positive for fluvial Arctic grayling, but these beneficial effects would be more localized because of the geographically-restricted project area. Alternative C would be similar to Alternative B in approach and content (umbrella Agreement, site-specific plans on enrolled lands, modification of land and water use to remove threats to fluvial Arctic grayling, etc.), but would only address a portion of the upper Big Hole River watershed and thus only encompass a portion of the fluvial Arctic grayling's distribution in the system. This alternative would involve the implementation of conservation measures on up to 130,000 acres of non-Federal lands in the vicinity of the Big Hole River between Wisdom and Little Lake Creek Bridge (see Figure 1). This segment of the Big Hole River is considered an important spawning and rearing location for fluvial Arctic grayling, but severe dewatering and habitat degradation have apparently reduced fluvial Arctic grayling abundance in that area in recent years (Magee and Lamothe 2004; MFWP et al. 2005, 2006). A number of large irrigation diversions in this river segment can exert a strong influence on hydrologic conditions and at least one has been shown to entrain fluvial Arctic grayling. Implementing conservation measures in this river segment to increase instream flows, restore riparian habitats, remove barriers to fluvial Arctic grayling movement and reduce entrainment threats would clearly be beneficial to fluvial Arctic grayling for the same reasons described under Alternative B. Under Alternative C, fluvial Arctic grayling that spawn, rear, migrate through, or otherwise use habitats in this river segment would benefit and fluvial Arctic grayling abundance in that area should increase. However, the limited spatial extent of Alternative C may not adequately address the habitat requirements of fluvial Arctic grayling at watershed scale and may unnecessarily exclude the involvement of some landowners willing to implement conservation measures to benefit fluvial Arctic grayling.

Degraded habitat conditions are widespread in the upper Big Hole River, and not limited to the hypothetical project area under Alternative C. Individual fluvial Arctic grayling may range across the watershed at different life stages or seasonally (Shepard and Oswald 1989; Lamothe and Magee 2003). Even if conditions improve at one location, the ecology of fluvial Arctic grayling suggests they may encounter poor conditions elsewhere as they move among or between complementary and supplementary habitats. The longitudinal connection of riverine systems and the extensive, though comparatively primitive, irrigation systems in the upper Big Hole River present the possibility that water conservation measures implemented in one river segment may not necessarily improve streamflows downstream (or even in the project area). Under Alternative C, irrigation diversions downstream of the project area may simply remove much of the conserved water if those irrigators are not implementing similar conservation measures. Moreover, irrigation diversions upstream of Alternative C's project area may preclude any actual conservation if inflows are low. However, this latter scenario is perhaps less likely because a number of the property owners encompassed by Alternative C have senior water rights and could request the reduction or shutdown of upstream irrigation diversions pursuant to their water rights.

Finally, limiting the project area to a specific river segment as described in Alternative C also may exclude landowners willing to conserve fluvial Arctic grayling and it appears that consistent and widespread implementation of conservation measures, especially those related to improving instream flows, would be necessary to address watershed-level threats to fluvial Arctic grayling. While Alternative C would improve conditions for fluvial Arctic grayling in a biologically-important river segment, participation at a larger scale (i.e., Alternative B) has a greater certainty of improving physical habitat conditions at a scale consistent with the ecology of fluvial Arctic grayling in that river system.

The types of short-term disturbance and any effects of handling fluvial Arctic grayling related to implementation of conservation measures under Alternative C would be similar to that described under Alternative B, but the overall magnitude of any negative effects would be correspondingly less because of the reduced project area. However, conservation benefits to fluvial Arctic grayling also would be correspondingly less under Alternative C.

Implementation of the conservation measures described under Alternative C should result in improved habitat conditions cool- and cold-water fish species in the project area. Thus, nonnative trout populations also may increase in the project area. Brook trout, in particular, are comparatively abundant in the limited umbrella project area and would be expected to increase in abundance under this alternative. As it is a modification of Alternative B, Alternative C also would presumably provide a mechanism to evaluate threats posed by nonnative trout (as with Alternative B), but (as with Alternative B) does not obligate a specific management remedy.

Alternative C is anticipated to result in positive effects for fluvial Arctic grayling and can be expected to increase spawning success and abundance in the proximity of the project area. This alternative may help secure an important habitat in the watershed, but the probability of long-term persistence of fluvial Arctic grayling is less than for Alternative B because Alternative C does not address overall habitat limitations at a scale commensurate with the ecology of the species.

## **Summary**

In order of beneficial effects to fluvial Arctic grayling, the three alternatives would be ranked as follows--(1) Alternative B, the proposed action; (2) Alternative C, limited umbrella Agreement; and (3) Alternative A, no action. Alternative B has the potential to improve physical habitat conditions for fluvial Arctic grayling across much of its current distribution in the Big Hole River. Alternative C would improve conditions in a particular, albeit important, segment in the watershed. While actions to improve habitat conditions for fluvial Arctic grayling may occur under Alternative C, it is uncertain whether they would be implemented at a scale necessary to adequately protect the existing population. Conversely, the effects of Alternative A may be largely negative where existing land and water use practices perpetuate threats to that have led to the endangerment of fluvial Arctic grayling.



## C. Hydrology

Aside from the effect of variable climatic conditions on streamflows, the most important influence on hydrologic conditions in the upper Big Hole River watershed is the diversion and application of irrigation water. The hydrologic consequences under each alternative will depend primarily on the extent to which they modify existing irrigation practices, but also will be affected by changes in riparian habitats.

### Alternative A

Alternative A (no action) generally describes the currently-existing conditions and represents negative hydrologic impacts to water quantity and quality through reduced surface water flows. Flood irrigation techniques are used to divert large volumes of water from the Big Hole River and its tributaries during approximately May-September and this water is applied to hay fields and pastures or used to water livestock. These irrigation techniques have been used in the basin for more than a century, and there is limited control over water because of a general absence of diversion control devices (e.g., headgates). The stream energy that would influence basic fluvial processes (of erosion and deposition) is dissipated by diverting large volumes of water and spreading that water over fields and pastures. Thus the physical template of the hydrologic system has likely been altered by irrigation. Few historical data are available on the actual volumes of water diverted, but recent information indicates that the flood irrigation techniques used in the upper Big Hole River watershed are relatively inefficient and that some fields and pastures are over-irrigated. Irrigation withdrawals, in concert with effects of drought, have attenuated high-flow events and lowered base flow conditions, and are responsible for changes to the system's natural hydrology. The upper Big Hole River is considered impaired by flow and thermal alterations under the State of Montana's 303(d) list. Stream temperatures in certain locations along the mainstem Big Hole River frequently exceed levels considered stressful for cool-water salmonid fishes like fluvial Arctic grayling (Magee and Lamothe 2003, 2004).

Discharge of groundwater to surface waters when streams are at or near baseflow should be a natural process in the Big Hole River, and flood irrigation techniques apparently influence this dynamic in some locations. There is some localized evidence in the system that existing flood irrigation practices promote groundwater recharge of the near-surface aquifer (Marvin 1997), that may discharge into surface waters and influence streamflows following the end of the growing season (e.g., Marvin and Voeller 2000). The same investigators concluded from a study site in the upper basin that that evapotranspiration largely counter-acted any positive effects of irrigation return flows to surface waters (Marvin and Voeller 2000). The location of groundwater storage may be quite different under current irrigation practices compared to the historical condition. For example, much of the groundwater recharge under irrigation may occur in the proximity of ditches (which leak) and near fields where the water is applied, which may extend miles from the active stream channel. Presumably, groundwater recharge under historical conditions would occur in closer proximity to the active channel. The volume and timing of surface-water discharge has likely been moved away from natural (historical) conditions by existing flood irrigation techniques.

Riparian zones are crucial for the ecological function of many aquatic systems, and can play a functional role in water storage and aquifer recharge (e.g., Pritchard et al. 1998). The widespread degradation and loss of riparian habitats in the upper Big Hole River watershed would indicate that any role riparian zones play in surface and ground water dynamics in the system is likely compromised.

The best available data indicate that Alternative A (no action) would result in the continued alteration of hydrologic conditions in the Big Hole River. The implementation of conservation measures to counteract this impairment is uncertain under Alternative A.

### **Alternatives B and C**

In contrast, Alternatives B and C include a suite of actions designed to modify existing irrigation practices and restore riparian habitats so that instream flows are increased, resulting in improved instream water quantity and quality. The difference between the latter two alternatives would be extent of those positive effects, as Alternative B is to be implemented throughout the upper watershed whereas Alternative B is limited to one river segment.

Alternatives B and C include a set of actions designed to decrease the amount of water diverted for agricultural purposes, and thus increase streamflows relative to current conditions so they are more representative of the system's presumed natural hydrograph. Both alternatives also include measures to conserve and restore riparian habitats, which also may improve hydrologic function relative to the no action alternative. The difference in the beneficial effects of Alternatives B and C again relates to the basic longitudinal connection of surface waters in riverine systems and the geographic scale of the project areas. Alternative C's project area includes one of the most hydrologically-altered stream segments in the upper basin. This segment between Wisdom and Little Lake Creek Bridge (see Figure 1) has a number of large irrigation diversions that can strongly affect flows. Surface water flow in this segment actually ceased for a few weeks during a drought in summer 1988. Implementing conservation measures under Alternative C should lead to positive hydrologic effects (i.e., increased instream flows and reduced stream temperatures) in the project segment and possibly downstream. However, the extensive diversion and irrigation system in the upper basin, coupled with potential for irrigators on non-enrolled lands upstream and downstream of the project area to divert water, raise the possibility that positive effects from Alternative C may be reduced or negligible outside its project area. Alternative B would be implemented across a larger area, essentially from the system's headwaters downstream over 80 mainstem river miles to Dickie Bridge (Figure 1). Thus, conservation measures would be implemented along contiguous river segments, and the probability that irrigation diversions on non-enrolled lands may counteract improved streamflows produced by actions on enrolled lands would be reduced because all landowners would be eligible to enroll. Thus, the hydrologic benefits for Alternative B (proposed action) should be more widespread than those for Alternative C (limited umbrella Agreement).

The overall benefits to hydrologic function from irrigation return flows in the upper basin are speculative. If irrigation return flows envisioned under Alternative A were found to provide benefits to hydrologic function, then implementation of Alternatives B and C may neutralize these benefits. This scenario appears unlikely. The benefits of keeping water in the natural river channel (versus the alternative of diverting it away from the stream with the expectation that irrigation return would subsequently conditions) are better supported by the scientific literature that suggests returning to a more natural flow regime helps hydrological and ecological processes (e.g., Poff et al. 1997).

## **Summary**

In order of beneficial effects hydrology, the three alternatives would be ranked as follows: (1) Alternative B, the proposed action; (2) Alternative C, limited umbrella Agreement; and (3) Alternative A, no action. The effects of Alternative C are mostly negative because this would not remedy continued alteration of hydrologic attributes, such as reduction in baseflows ; reduced frequency, duration and magnitude of high-flow events; and continuing thermal alterations. Alternatives B and C would both improve hydrological processes and instream water quantity and quality, but Alternative B is expected to realize these benefits across a larger area.

## **D. Vegetation**

The private lands considered in the analysis are almost exclusively agricultural and ranchlands. The land use would not change under any of the alternatives, but some specific practices, methods or infrastructure may result in changes to the vegetation communities in the project area. Changes to the vegetation communities on private lands in the upper Big Hole River watershed can be categorized by their effects on the three dominant land use or cover types: non-irrigated rangeland, irrigated hay fields and pasture, and riparian zones.

## **Alternative A**

Effects to vegetation under the Alternative A, the No Action Alternative would be similar to current conditions. Data collected by NRCS indicates that private rangelands in the upper Big Hole River contain a mix of native and introduced species and are degraded relative to expected historical conditions for that location (Tim Griffiths, NRCS, pers. comm.). The "range similarity index," which characterizes current range conditions relative to the expected historical condition, indicates that current rangelands are 20-30% of the expected species composition and productivity, with a few in the 40% range (Tim Griffith, NRCS, pers. comm.; Kris Berg, NRCS, pers. comm.). The vegetation community in hay fields and pastures is a mix of native and introduced species, and has been altered by flood irrigation practices. The majority of the plant species found in hay fields and pastures are facultative or obligate wetland species (i.e., hydrophytes; Tim Griffith, NRCS, pers. comm.) such as sedges (Kris Berg, NRCS, pers. comm.), which is presumably caused by overirrigation. Areas of the upper watershed show significant loss of riparian vegetation (OEA 1995), especially willows, which has been attributed primarily to livestock grazing in

the riparian zones (Lamothe and Magee 2003). Overall, under the No Action Alternative, it is presumed that this general degradation of the vegetation communities would largely continue.

Idaho sedge, a USFS and BLM sensitive plant species in the proposed project area, may be negatively affected by the No Action Alternative. Idaho sedge is typically found in at the transition between wet meadow and sagebrush steppe habitat, and is threatened by heavy livestock grazing, competition with exotic species, hydrologic alterations, agricultural development and road construction and maintenance (Montana Plan Field Guide, Montana Natural Heritage Program ><http://nhp.nris.mt.gov/plants/index.html?guidebook.asp><). The available information on the project area suggests livestock grazing is heavy in certain locations and hydrologic alterations are substantial, but their overall effect on Idaho sedge is not known. Lemhi Beardtongue, also a sensitive species, is present in the proposed project area and grows in habitat dominated by sagebrush and bunchgrasses, but may be less affected by agricultural and ranching activities on private lands because it's primary threats are encroachment by spotted knapweed and changes in wildfire frequency (Montana Plan Field Guide, Montana Natural Heritage Program ><http://nhp.nris.mt.gov/plants/index.html?guidebook.asp><).

## **Alternative B**

Alternative B, the Proposed Action Alternative, should generally result in beneficial effects for native vegetation. The combination of conservation measures to be implemented under the Agreement, which includes irrigation water management, prescribed grazing, and riparian restoration, should favor native vegetation communities on rangelands, hay fields and pasture, and riparian zones. On rangelands, prescribed grazing plans to be developed under the Proposed Action should favor native vegetation, and shift the community composition (and its forage productivity) so that it is more representative of historical conditions (Tim Griffiths, NRCS, pers. comm.). Hay fields and pastures should be affected by irrigation water management plans developed under the Agreement such that incidental (artificial) wetlands or hydrophytic plant communities in uncharacteristic locations should shift to more dry-land species (Tim Griffiths, pers. comm.). Specifically, changes are expected where hydrophytic plants, such as sedges, occupy higher ground (benches) because irrigation on these areas would likely be reduced under irrigation water management plans (Tim Griffiths, pers. comm.). Thus, the plant community in these locations would likely shift back to native dry-land species more characteristic of the site. Natural wetlands which occupy lower-lying areas would not be altered by the Agreement. Any changes to natural wetlands would require compliance with State and Federal regulations. Sensitive Idaho sedge should benefit where conservation measures reduce grazing pressure and reduce hydrologic alterations, and compliance with State and Federal regulations are expected to limit any Agreement-related impacts to this or other sensitive plant species identified (see Part VI, A of this EA). Riparian habitats would be conserved or restored through prescribed grazing plans or other conservation measures implemented through the Agreement. Overall, the Proposed Action should result in beneficial effects for native plant species and communities.

## **Alternative C**

Under Alternative C, the Limited Umbrella Agreement, the effect to plant species and their communities would be positive and similar to those under the Proposed Action, except that a smaller area would be affected by habitat enhancement measures. The positive effects to native plant species and communities in rangelands, hay fields and pastures, and riparian zones under Alternative C would be as described above under the Proposed Action Alternative, but limited to private lands in the vicinity of Wisdom. Overall, Alternative C should result in beneficial effects for native plant species and communities on private lands in the Limited Umbrella Agreement project area.

## **Summary**

In order of net beneficial effects to the plant communities in the Big Hole River watershed, the three alternatives would be ranked as follows--(1) Alternative B, proposed action; (2) Alternative C, limited umbrella Agreement, and (3) Alternative A, no action. Existing land and water use practices under the No Action Alternative would likely perpetuate the degraded conditions on non-irrigated rangelands, irrigated hay fields and pasture, and riparian zones. In contrast, the conservation measures to be implemented under Alternatives B and C would be expected to benefit the native plant communities in these habitats by returning them to a species composition more representative of historical conditions. These positive changes would be realized over a larger area under the Proposed Action Alternative compared to the Limited Umbrella Agreement Alternative.

## **E. Wetlands**

Two of the alternatives, the Proposed Action (Alternative B) and the limited umbrella Agreement (Alternative C), propose conservation measures to benefit grayling that would either directly or indirectly influence hydrologic patterns and plant communities at varying scales. Wetlands are habitats defined in terms of specific hydrologic and vegetation characteristics (Cowardin et al. 1979), so Alternatives B and C are expected to affect some wetlands habitats relative to current conditions. Effects are anticipated to be different depending on whether the wetlands are maintained by natural physical processes vs. human activity.

## **Alternative A**

Effects to wetlands under the Alternative A, the No Action Alternative would be similar to current conditions. Any projects that would be potentially undertaken to benefit fluvial Arctic grayling would need to be implemented in light of any applicable State or Federal regulations protecting wetlands. Irrigation practices in the upper Big Hole River watershed have apparently facilitated the spread of hydrophytic (wetland-adapted) plant species into locations with topography generally not conducive to these species, such as benches or on slopes (Upper Big Hole River TMDL 2003; Tim Griffiths, NRCS, pers. comm.). Sedge meadows can occur where irrigation ditches run through large flat areas, along irrigation ditches, in low-lying areas that tend to remain wet or inundated, and at the end of flood

irrigation network (DTM Consulting, Inc. et al. 2005). Irrigation is practiced across tens of thousands of acres in the upper Big Hole River watershed (Montana NRIS), but USFWS could find no specific data on the relative composition of wetlands created or maintained by flood irrigation (i.e., incidental wetlands) vs. natural wetlands.

### **Alternative B**

Under Alternative B, the Proposed Action Alternative, there should be no significant impact to natural wetlands, but some incidental wetlands may be affected. The agencies involved in the Proposed Action Alternative are generally precluded from impacting wetlands by State and Federal regulations, unless a Clean Water Act section 404 permit is obtained from the U.S. Army Corps of Engineers. Agency planning processes and environmental compliance provisions (e.g., see Appendices 3 and 5) should ensure that natural wetlands are not adversely affected by the Agreement. However, incidental wetlands that are created or sustained through overirrigation or are present in atypical locations may be affected by the Agreement. For example, wetlands or wetland plant communities located on steep slopes or at the terminus of a flood irrigation network may be affected where improved irrigation water management reduces the amount of water delivered to these locations. The extent of incidental wetlands, as well as those incidental wetlands that may be affected by the Agreement, is presently unknown. However, any changes to incidentally created or maintained wetlands under the Proposed Action would appear to promote habitat conditions more characteristic of the natural topography and hydrology at those locations.

### **Alternative C**

Under Alternative C, the Limited Umbrella Agreement, the effect to wetlands would be similar to that under the Proposed Action. Specifically, there should be no significant effect on natural wetlands, but some incidental wetlands may be affected by the implementation of conservation measures that improve irrigation water management. Any impacts to incidental wetlands should be realized over a smaller area for Alternative C compared to the Proposed Action.

### **Summary**

Alternative A, No Action, represents the status quo whereby no changes to wetlands are expected relative to current conditions. Alternatives B, Proposed Action, and C, limited umbrella Agreement, should not affect natural wetlands habitats. However, Alternatives B and C may affect some incidental wetlands habitats that are created or maintained in atypical locations because of overirrigation. The proportion of incidental wetlands (vs. natural) wetlands in the project area is unknown. The specific site characteristics (e.g., soil type, hill slope, irrigation amount) delineating an incidental wetland that would be affected, versus not affected, by conservation measures implemented under these two alternatives also is unknown.

## **F. Fisheries**

The general effect of the three alternative actions on the fishes residing in the project area should be roughly similar to that described for fluvial Arctic grayling (see Part B above), based on the assumption that the abiotic conditions that are currently depressing the fluvial Arctic grayling population (i.e., stream dewatering; thermal loading; habitat loss, degradation and fragmentation, etc.) also are influencing and in some cases regulating populations of other naturalized fishes. While at least 12 species of native and introduced fishes are known or believed to be present in the proposed project area (Table 6), a lack of data precludes a species-by-species analysis for each one. Instead, this analysis will describe how the alternative actions may affect the overall fish community and make special reference to specific native fishes where appropriate. Many of the projects that would be implemented under the proposed actions, while intended primarily to benefit fluvial Arctic grayling, are rather general in character (i.e., increase instream flows during summer months) and would be expected to similarly affect a suite of fish species having similar habitat requirements. The effect of the alternative actions on recreational angling will be analyzed in another section of this document.

### **Alternative A**

The effect of Alternative A (No Action) would appear to be largely negative for many fish species where environmental conditions create a conflict over water use and tend to perpetuate the same land and water use practices that have led to a general decline in the structure and function of the Big Hole River. Chronic and severe dewatering, loss of functional riparian zones, channel alterations, thermal loading, cross-channel diversion structures which block fish movement, and entrainment in irrigation ditches are some of the human-influenced factors which may influence resident fish populations. In addition to fluvial Arctic grayling, both native species (e.g., white sucker, mountain whitefish, longnose suckers, longnose dace and burbot) and nonnative species (e.g., brook trout) are known to be entrained in irrigation ditches (Lamothe and Magee 2003; J. Magee, MFWP, pers. comm.). Both of these species can move up to tens of miles (e.g., Lamothe and Magee 2003), which highlights the importance of maintaining connection between riverine habitats throughout the watershed. A fish kill in the Big Hole during 1994 resulted in the death of a number of mountain whitefish, white suckers, longnose suckers, longnose dace, burbot, mottled sculpin, fluvial Arctic grayling, and brook trout; and was blamed on high water temperatures (Byorth 1995). The current fishery resources and community structure would likely remain at current levels or change in a negative direction in the absence of measures to address these issues.

Under the status quo, which assumes habitat conditions stay the same or possibly deteriorate further, an expected outcome would be reduced abundance and distribution of existing species, loss of "desirable" species, or possibly the addition of "undesirable" species to the fish community. Where brook trout co-occur with fluvial Arctic grayling in the upper watershed, their relative abundances generally fluctuate in concert (e.g., Magee and Opitz 2000). Abundance of brown and rainbow trout downstream from the project area has declined in recent years, presumably as a consequence of stressful hydrologic and thermal



conditions (Oswald 2005). Little information is available on the population status native non-game fish species in the project area (e.g., suckers, sculpin, and dace). However, these species are presumably adapted to the hydrologic and habitat conditions prior to the Euro-American settlement, so the land and water uses that currently influence the Big Hole River are likely detrimental, rather than neutral or beneficial changes. Habitat loss, in concert with effects of nonnative trout, is a major threat to native westslope cutthroat trout in

the watershed. While much of the currently-occupied westslope cutthroat trout habitat occurs outside the proposed action area, perpetuation of degraded habitat conditions elsewhere may preclude expansion of cutthroat trout into historical habitats.

Habitat degradation and alteration can shift community composition to more tolerant or disturbance-resistant fish species. For example, brook trout, brown trout and rainbow trout have been characterized as more tolerant of higher water temperatures based on their critical thermal maximum values compared with fluvial Arctic grayling (Selong et al. 2001). Thus, thermal loading may produce conditions favoring the established introduced salmonids at the expense of native salmonids having more stringent thermal requirements (e.g., Arctic grayling). Continued habitat degradation may increase the probability that fish species tolerant of poor water quality become established in the project area.

As was described in environmental analysis for fluvial Arctic grayling, there are a suite of projects that could be implemented to address some of the instream flow and habitat degradation issues which affect fluvial Arctic grayling and likely other resident species as well, the certainty that they would be systematically implemented is low under Alternative A. Any actions taken to benefit fluvial Arctic grayling would likely accrue some benefit for most, if not all resident fishes in the project area. However, with the exception of westslope cutthroat trout, conservation actions taken to specifically benefit fishes other than fluvial Arctic grayling appears highly unlikely given the social, biological and technical challenges to fluvial Arctic grayling conservation in the watershed.

The probability of a fluvial Arctic grayling listing is probably greatest for Alternative A. Conversely, if fluvial Arctic grayling were listed, then such a listing may result in the incidental protection of other species where ESA requirements or any enforcement actions result in improved habitat. However, an ESA listing may complicate conservation and management and reduce the willingness of private landowners to participate in such efforts.

## **ALTERNATIVE B**

The effect of Alternative B (Proposed Action) should be positive for most of the native and nonnative fishes present in the project area. The conservation measures of the Agreement are designed to help fluvial Arctic grayling by improving instream flows, conserving or restoring riparian habitats, removing or mitigating for physical barriers to movement and addressing population-level threats from entrainment. These first two conservation measures, in particular, are quite general in terms of their effect on fish habitat and can be reasonably expected to be beneficial to resident fishes as well. The Big Hole River in the project area has been highly altered by land and water use, and the proposed action seeks to

reverse some of this alteration. It seems unlikely that actions that remedy degraded habitat conditions, and attempt to restore abiotic and biotic elements of a functional river ecosystem, would have direct negative consequences for a native resident fish species. Similar positive effects are supposed for nonnative fish species in the project area, especially for brook trout, brown trout and rainbow trout. In general and for most (if not all) resident fish species, the improved habitat condition from Alternative B should increase the carrying capacity of currently occupied habitats and increase the extent of suitable habitat.

Native fishes also may benefit where conservation measures are implemented to reduce population-level threats to fluvial Arctic grayling from entrainment. Installation of fish screens or other exclusion devices to benefit fluvial Arctic grayling also would keep many native fishes out of irrigation ditches, where their growth and survival would presumably be less compared with in a natural stream channel.

The removal or mitigation of physical barriers to fluvial Arctic grayling movement may have both positive and negative effects on other fishes, depending upon the ecological context of the particular barrier. While the Agreement makes specific provisions to provide passage for fluvial Arctic grayling (i.e., passage designed specifically for fluvial Arctic grayling), passage for other species with similar swimming abilities also should be provided. In general, removal of any barriers to fluvial Arctic grayling movement along the mainstem Big Hole River in the project area should facilitate passage of other fish species and reduce the frequency and extent of habitat fragmentation. Habitat connectivity is important for many fish species that require spawning, rearing and refuge habitat that may be separated in time and space (Schlosser and Angermeier 1995), thus the ability to move among these habitats may be essential for their persistence.

The potential for negative effects of barrier removal or mitigation focuses primarily on situations where the removal of a barrier to facilitate fluvial Arctic grayling passage could create a pathway for the invasion of nonnative trout. Westslope cutthroat trout in the Big Hole River watershed are threatened by encroachment from nonnative trout (Shepard et al. 2003), which can lead to displacement (brook trout) or hybridization (rainbow trout and Yellowstone cutthroat trout). This potential problem would be most likely to be observed in tributaries to the Big Hole River, because westslope cutthroat trout are seldom found in the mainstem river. Westslope cutthroat trout in the drainage, and elsewhere in its native range, are often subject to isolation management whereby their populations are isolated above a natural or manmade barrier to reduce the threat from nonnative trout. Removal of such a barrier to benefit fluvial Arctic grayling would thus be in direct opposition to management of another fish species of concern. Given the current distributions of fluvial Arctic grayling and cutthroat trout in the system (cutthroat trout in headwater streams, fluvial Arctic grayling in lower tributary reaches and mainstem river), this particular problem is anticipated to be infrequent. However, the Proposed Action explicitly notes this concern and states that potential impacts to native fish species would be analyzed prior to making a decision to remove any barrier.

Indirect effects of nonnative trout on native fish species also are possible as a consequence Alternative B. Alternative B is anticipated to result in changes in habitat conditions that would be beneficial to all species, including nonnative trout. It is currently not known if competition and predation by nonnative trout species are important mechanisms influencing the population status of native fish species in the project area, but it is reasonable to assume that the abundance and distribution of nonnative trout would increase because of improved habitat conditions. Abiotic (habitat) conditions are currently perceived to be a more significant influence on native fishes in the project area than competitive interactions, but if the proposed action removes some of these abiotic limitations (i.e., dewatering, thermal loading) then biotic factors may come to play a more significant role.

### **Alternative C**

The effect of Alternative C (limited umbrella Agreement) on fishes should be generally positive, but the beneficial effects may be localized and species-specific because of the restricted scope of the project area. The types of specific actions and general consequences of these actions are adequately presented in the analysis for fluvial Arctic grayling in earlier paragraphs in this section. In general, Alternative C should result in beneficial effects for fish species that either reside in or seasonally utilize habitats in the project area because of the somewhat localized nature of the expected habitat improvements or conservation actions. Fish species that are not believed to exhibit wide-spread ranging behavior, for example mottled sculpin, and tend to reside in one area should especially benefit from improved local habitat conditions. In contrast, more wide-ranging fish species such as fluvial Arctic grayling (described earlier) or white sucker (that can move tens of miles; Lamothe and Magee 2003) may still require habitats only present in other locations in the watershed. If conditions remain degraded elsewhere in the watershed or if fishes encounter these conditions when passing through a migration corridor, then the positive effects of improved habitat conditions in one (albeit large) location may be tempered. If many individuals of a particular species are entrained in irrigation ditches in the area encompassed by Alternative C, then the proposed rescue efforts may provide a significant benefit. If entrainment occurs elsewhere, the overall benefits may be less certain.

The potential negative effects of Alternative C are similar to those described for the other alternatives but scaled based on the different-sized project area. Alternative C does not address habitat conditions elsewhere in the upper watershed. Conflicts in native fish conservation resulting from the potential removal of certain barriers may still occur, but such conflicts would be less numerous compared to Alternative B. Brook trout are the most common nonnative salmonid in the project area encompassed by Alternative C, and their abundance would be expected to increase. However, Alternative C may be less likely to facilitate the expansion of brown trout into the project area because a considerable gap would remain between the "improved" habitat and river reaches where brown trout are currently most abundant. Such expansion may still occur, but may be less rapid compared to Alternative B which would attempt to improve conditions along a contiguous river segment.

## **Summary**

In order of net beneficial effects to the fishes present in the upper Big Hole River, the three alternatives would be ranked as follows--(1) Alternative B, proposed action;

(2) Alternative C, limited umbrella Agreement, and (3) Alternative A, no action.

Alternative B has the potential to improve physical habitat conditions for fishes across the largest area, and may lead to the increased abundance and distribution of many resident species. Alternative C would improve conditions in a particular location in the watershed, and may provide benefits to more sedentary fish species but perhaps limited benefits to those more wide-ranging species that also use habitats in other parts of the watershed.

Alternatives B and C have some potential negative aspects (barrier removal conflicts, nonnative trout), whereas the overall effect of Alternative A may be largely negative if the existing land and water use practices perpetuate the ongoing degradation of the riverine system.

## **G. Wildlife**

The private lands considered in the analysis are almost exclusively agricultural and ranchlands. The land use would not change under any of the alternatives, but some specific practices, methods or infrastructure may change.

### **Alternative A**

Effects to other wildlife species, including sensitive species, under the Alternative A, the No Action Alternative, would be similar to current conditions. Continued degradation of the riparian habitat may continue to have a detrimental effect on those species that depend on riparian zones or aquatic habitats for food, shelter, or migratory pathways.

### **Alternative B**

Under Alternative B, the Proposed Action Alternative, there should be no significant negative impacts on wildlife species. The numerous wildlife species that utilize riparian habitats might directly or indirectly realize benefits from actions that would be implemented under the Agreement. Conservation and rehabilitation of riparian habitats should be beneficial for wildlife species because of the importance of such habitats for feeding, reproduction, shelter and movement (reviewed by Kauffman and Krueger 1984). Responses by wildlife species would be concentrated mostly at locations where there are actual changes in riparian vegetation from the fluvial Arctic grayling conservation measures. The implementation of some conservation measures (e.g., installing a new headgate, constructing a stock watering facility) would involve a short-term ground disturbance, but the long-term effect on wildlife habitat would be positive because hydrologic and riparian habitat conditions would improve. Therefore, effects to these species would be minimal under the Proposed Action.

As noted earlier, some "incidental" wetlands created by inefficient irrigation practices may be negatively affected by proposed changes under the Agreement, so wetland-dependent species (e.g., waterfowl such as Canada geese, mallards, teal, etc.) may be affected. However, these species are native to the area and highly mobile, so should be adapted to respond to spatial and temporal changes in wetlands. Thus, these species are expected to respond to any reduction in incidental wetlands by shifting to alternate natural wetlands within the project area which probably, over time, provide more benefits to wetland-dependent species.

Conservation of sensitive wildlife species other than fluvial Arctic grayling would likely indirectly benefit from actions in the Proposed Action, because of the focus on those lands where collaborative efforts are projected to occur between Participating Landowners and the agencies. Bald eagles have been observed in the project area, but the nest location for this bald eagle territory is downstream outside the project area so the Proposed Action should not affect bald eagle reproduction. Bald eagles are most likely foraging for fish in the project area, so habitat improvements realized under the Proposed Action should indirectly benefit eagles by increasing its prey base (i.e., the fishery in the project area). The Proposed Action should not affect Canada lynx, because they are thought to infrequently occur in the project area (predominantly range-grassland) as this is not their preferred habitat (i.e., montane coniferous forests). Moreover, the small amount of coniferous forest present in the project area is unlikely to be affected by the proposed action, which focuses on rangeland, agricultural lands, and riparian zones. Gray wolves also should not be affected because the resident pack in the project area has been controlled because of livestock depredations. Sage-grouse should not be affected because the Proposed Action does not propose any general changes in land use and would not result in the destruction of sage habitat. No adverse effects are anticipated for northern goshawk or great gray owl.

While the attention would be directed toward fluvial Arctic grayling, it is reasonable to expect that conservation benefits for rare or sensitive plants and animals would be noted, with accompanying recommendations from the agencies for their protection, as well. The Proposed Action would not negatively impact these species.

### **Alternative C**

Under Alternative C, the effect to wildlife species and their associated habitats are similar to those under the Proposed Action, except, as noted above, there would likely be a somewhat greater number of fluvial Arctic grayling related conservation measures implemented under the Proposed Action than under Alternative C. Effects to other species from this activity are expected to be positive for some species, or negligible for other species, due to the smaller area that is likely to be affected by habitat enhancement measures. We do not anticipate that any native species would be negatively affected by habitat enhancement measures.

## **Summary**

In general, there should be no significant negative effects to wildlife species for Alternatives B and C, and these two alternatives should be beneficial for many species compared to the No Action Alternative. In order of net beneficial effects to wildlife present in the upper Big Hole River watershed, the three alternatives would be ranked as follows--(1) Alternative B, proposed action; (2) Alternative C, limited umbrella Agreement, and (3) Alternative A, no action. Under Alternatives B and C, the many wildlife species that use riparian habitats should benefit where conservation measures to help fluvial Arctic grayling result in the conservation or rehabilitation of riparian habitats. Alternative B has the potential to improve physical habitat conditions that would benefit wildlife across the largest area. Alternative C would improve conditions in a particular location in the watershed but not in as large an area as under Alternative B. Alternatives B and C may negatively affect some wildlife species, especially waterfowl, that use incidental wetlands created by overirrigation. However, these effects should be temporary and not significant because the affected species are highly mobile would likely utilize alternate (natural) wetlands in the project area.

## **H. Social and Economic Considerations**

### **(1) Cultural And Historic Resources**

Any activity that requires ground disturbance is defined, in the context of this analysis, as an action with the potential to affect cultural and historic resources in the proposed project area. In this context, each of the three alternatives may include actions or practices (Table 1) that can potentially impact the type of cultural and historic resources present in the project area (Table 8). The differences among the alternatives in their influence on these resources depend primarily on specific actions/practices required, the (spatial) extent to which they would be applied, and the regulatory obligations incumbent on the participating parties.

Three general concepts establish the context for the analysis of effects of cultural and historic resources. First, the lands being considered in this analysis are almost exclusively privately owned (Figures 4-5) and dedicated to agricultural production, especially livestock ranching (Table 11). This general land use (i.e., agriculture) would not change, but alternative land and water use methods or techniques may be used on these lands to reduce and reverse impacts to habitat for fluvial Arctic grayling. Second, because the actual participation in any of the alternatives is unknown and data collection would be required before proposing specific actions on any given property, it is premature to analyze how the alternatives may impact the specific cultural and historical sites listed in Table 8. Instead, project or site-level analyses would be required on each property to ensure that these specific sites would not be adversely affected. Third, State and Federal agencies have specific regulatory requirements and associated accountability (vs. private landowners) in cases where they advocate, design, implement or are otherwise involved in any site-specific project involving ground disturbance. For this analysis, it is assumed that the State and Federal agencies involved in such a project within the context of any of the three alternatives would adhere to the appropriate environmental review requirements to protect cultural and historic resources. These

requirements may, in some cases, necessitate project-level analyses (i.e., of site-specific plans) and involve consultation with the Montana SHPO, and compliance with applicable State and Federal regulations including MEPA, NEPA, and NHPA.

### **Alternative A**

Under Alternative A (no action) there should be no impact to previously identified cultural and historic sites; however, the potential does exist for negative impacts to sites that may be present but have not yet been identified or located by archaeological or historical surveys. Alternative A represents the status quo, so the existing agricultural and ranching activities would largely continue unchanged in the project area. To the extent that private landowners are already aware of the previously identified cultural and historic sites (i.e., the 185 sites listed in Table 8), this analysis assumes that landowners avoid disturbing those sites in the course of conducting their agricultural operations. Thus, the existing identified sites are presumed to be protected (i.e. no impact). However, the potential for agricultural activities to disturb cultural or historic sites may exist under situations where--(a) existing activities inadvertently or unknowingly disturb a site that has not yet been identified, or (b) landowner-directed changes to existing practices disturb known or previously unidentified sites. Hypothetical examples of each include--(a) discovery and disturbance of a lithic scatter operation of an existing corral or livestock processing area, and (b) construction of a new irrigation ditch which either disturbs, through its construction, a previously unknown tipi ring or whose subsequent operation results in frequent flooding of an historic homestead site.

As previously noted, the probability that private landowners would modify their existing land and water use practices to benefit fluvial Arctic grayling is comparatively low under Alternative A. However, if they chose to do so and collaborated with State and Federal agencies, then such changes would require a level of environmental review where ground disturbing activities are proposed that would likely exceed their corresponding individual obligations. In some cases, the project-level analysis necessitated by agency involvement may result in the identification of previously undetected cultural or historic resources and would certainly provide information on known sites that could be considered in project planning and prior to any planned ground disturbing activities. The overall extent of such analysis would again depend on the level of private landowner participation and the involvement of State or Federal agencies, which is expected to be low under Alternative A, and the specific activities involved on any particular property.

### **Alternative B**

Under Alternative B (Proposed Action) there should be no impact to cultural and historic sites. Whereas this alternative may involve a change in agricultural practices or infrastructure and a suite of potentially ground-disturbing activities (Table 1) which would be implemented across a larger area than either Alternatives A and C, the Proposed Action explicitly involves State and Federal agencies in the planning process (site-specific plan development) and may require project-level environmental analysis.



Agency involvement, and any required project or site-level environmental review to confirm that actions comply with laws and regulations that protect cultural and historic resources (e.g., MEPA, NEPA, or NHPA), should provide protection to known resources or those identified through surveys or in consultation with Montana SHPO.

Ground-disturbing activities proposed in site-specific plans under the Agreement may be subject to environmental analysis by the action agency, and USFWS provides oversight and final approval of site-specific plans before any CIs can be issued and regulatory assurances extended to participating landowners.

Ultimately, ground disturbance may occur on some properties in the proposed project area as a result of implementing conservation measures under Alternative B to benefit fluvial Arctic grayling. However, the structure of the Agreement and the involvement of State and Federal agencies indicate that sufficient regulatory mechanisms are in place to protect cultural and historic sites in the proposed project area.

### **Alternative C**

Under Alternative C (limited umbrella Agreement) there should be no impact to cultural and historic sites. Analysis of environmental consequences for any site-specific plans proposed under this alternative would be identical to that described under Alternative B (Proposed Action). Specifically, the State and Federal agencies are involved in the planning process and may conduct environmental analysis and review where ground disturbing activities could affect cultural and historic resources. The potential area of disturbance is smaller than under Alternative B, but the same regulatory protections should be in place to protect any cultural and historic resources identified on involved properties.

### **Summary**

All three alternatives should generally result in no impact to cultural and historic resources in the upper Big Hole River watershed compared to current conditions. Although Alternatives B (Proposed Action) and C (limited umbrella Agreement) may require some ground-disturbing activities to implement conservation measures to benefit fluvial Arctic grayling (see Table 1), protection of cultural and historic resources is anticipated through the involvement of State and Federal agencies in the project-planning (site-specific development) phase and their associated regulatory requirements. Under some scenarios, unintentional disturbance to cultural and historic sites may result from private landowner activities under Alternative A.

### **(2) Local Communities And Their Economies**

The effect of the proposed action and the alternatives on the local communities in the upper Big Hole River would be gauged by their influence on the social and economic underpinnings of the traditional ranching culture that currently exists in the proposed project area. One assumption in this section, and throughout this assessment, is that the dominant land use in the affected area would not change. Agriculture and ranching

would continue in the affected area; however, specific practices or infrastructure would be modified in some cases (e.g., amount or timing of irrigation, diversion structures, extent of grazing in riparian areas, species composition of hay grasses, etc.) to benefit fluvial Arctic grayling.

The listing of fluvial Arctic grayling under the ESA is perceived by residents of the Big Hole as a significant threat to their livelihoods because of the potential for regulatory enforcement actions could conceivably restrict or modify existing land and water use practices and reduce agricultural revenue.

### **Alternative A**

Effects to the local communities in the project area under Alternative A (No Action) would be similar to current conditions. However, the likelihood of listing the fluvial Arctic grayling under the ESA is considered more likely under the No Action Alternative than the other two alternatives because fewer conservation measures to benefit fluvial Arctic grayling would be implemented. The listing of fluvial Arctic grayling under the ESA is perceived by residents of the Big Hole as a significant threat to their livelihoods because of the potential for regulatory enforcement actions to disrupt their accustomed ranching activities. The diversion of surface waters to irrigate hay fields or pasture or to water livestock represents an otherwise-legal activity that may be subject to take prohibitions under section 9 of the ESA should fluvial Arctic grayling be listed as threatened or endangered. Similarly, entrainment of fluvial Arctic grayling in irrigation ditches may be subject to similar prohibitions. If private landowners were required to implement take avoidance measures, then this may impose an economic burden in terms of the actual cost of implementing such measures (e.g., installing a fish screen) or through the loss of revenue where agricultural operations were affected. The overall effect of an ESA listing on the local community in the affected area cannot be known with certainty, but would most likely result in some situations of at least temporary economic hardship or possibly changes in land use or ownership.

While the potential effects of an ESA listing are speculative, it has been suggested that current land and water use practices in certain locations within the affected area may be ecologically unsustainable. Water consumption has apparently increased in recent decades because the irrigation of pastures that has extended the irrigation season past its traditional endpoint in July (DTM Consulting et al. 2005). Climatic conditions have resulted in lower than average snowpack in recent years, thus less water has been available for both instream and agricultural uses. If these trends for increased water demand during a period of reduced supply continue, then the status quo economic output of local ranches may be difficult to maintain irrespective of the listing status of fluvial Arctic grayling.

Under the No Action Alternative, private landowners may choose to implement conservation measures to benefit fluvial Arctic grayling. They would be solely responsible for the cost of such measures if they chose to implement them independently. They may be able to obtain cost-share for those same measures should

State or Federal agencies or a nonprofit organization (e.g., watershed group) participate in the planning and/or implementation, and thus reduce the associated financial burden. However, the probability of conservation measures actually being implemented is less under the No Action Alternative because private landowners would not be receiving regulatory assurances.

## **Alternative B**

The land-use planning process to be utilized under Alternative B, the Proposed Action, is expected to result in economically and ecologically sustainable ranching operations in the project area, so no long-term economic or social impacts are anticipated. The NRCS would play a central role in land use planning under the Proposed Action, and would take the lead in developing major components of the site-specific plans including prescribed grazing, irrigation water management, riparian conditions, and nutrient management (MFWP et al. 2005, 2006). All NRCS plans under the Proposed Action would generally be developed under Resource Management Standards (NRCS 2000). Under Resource Management Standards level plans, the practices to be implemented must meet *quality criteria* for resource sustainability. *Quality criteria* are defined as “quantitative or qualitative statements that are established in accordance with local, State, and Federal programs and regulations in consideration of ecological, economic and social effects” (NRCS 2001). These criteria represent a level “that sustains the use and productivity of the resource indefinitely”, although it is noted that short-term effects are possible to achieve long-term benefits (NRCS 2001). Overall, the planning process to be used by NRCS in the context of site-specific plans developed under the Proposed Action should result in the implementation of practices that would “provide for the long-term conservation, protection and/or improvement of the resource base” (NRCS 2001).

Capital or labor expenses needed to implement fluvial Arctic grayling conservation measures under the Proposed Action would be covered by State and Federal funding programs, to the extent possible. A suite of funding options is available through, for example, various Farm Bill programs administered by NRCS, and Future Fisheries Improvement Program administered by MFWP (MFWP et al. 2005, 2006). However, financial or labor investments by participating landowners may be needed in some cases to implement conservation measures. Contributions from landowners may be expected where funding programs require cost-share from participants or where a participant’s income exceeds program criteria and precludes participation.

Under the Proposed Action, the economic output of agricultural lands should be equal to current levels because of more efficient utilization of resources leading to economically and ecologically sustainable ranching operations. Changes in ownership caused by economic hardship should be minimal or nil, and the cost of implementing conservation measures would be offset by State and Federal programs in many cases. Thus, the traditional ranching culture in the project area should remain largely intact and there should be no negative effect on the local community and its economy.

## **Alternative C**

The land-use planning process to be utilized under Alternative C (limited umbrella Agreement) would be identical to that used for Alternative B (Proposed Action) and is expected to result in economically and ecologically sustainable ranching operations in the limited project area, so no long-term economic or social impacts are anticipated. Participating landowners under Alternative C would be conducting their ranching operations in accordance with the sustainability principles described under the Proposed Action, but these principles would be only uniformly applied across the limited project area (i.e., a portion of the upper watershed). Condition of private lands outside the limited project area would be as described under the No Action Alternative.

The potential for social tensions between landowners may exist under Alternative C because of the exclusive description of the limited project area versus the more inclusive and larger project area for the Proposed Action. Landowners participating in Alternative C would receive ESA regulatory assurances for implementing conservation actions to benefit fluvial Arctic grayling, whereas those landowners outside the limited project area would not receive assurances for implementing identical measures unless they were covered under another Agreement. The USFWS is not aware of the development of any other Agreement to benefit fluvial Arctic grayling besides the Proposed Action.

There may be perceived or real differences in cost-share or funding support for implementing conservation measures. Some landowners may anticipate that participation in the Agreement is a prerequisite to obtain financial assistance to implement conservation measures to benefit fluvial Arctic grayling. This should generally not be the case because similar funding mechanisms should be available to address the needs of both Agreement and non-Agreement participants.

However, it is conceivable that the prioritization system of some funding programs may recognize existing conservation agreements, so that Agreement participants would have a greater likelihood of receiving such funds.

Overall, there are no anticipated long-term impacts to the local communities and economies of the upper Big Hole River watershed as a result of implementing Alternative C. This alternative represents a combination of the Proposed Action (i.e., inside the limited project area) and the No Action Alternative (i.e., outside the limited project area), both of which individually were concluded to have no effect. Thus, under Alternative C ranch production and land ownership should remain similar to current conditions, and the local ranching culture would not be significantly affected.

## **Summary**

Each of the three alternative actions is expected to have no affect on the ranching community in the upper Big Hole River watershed and its economy although there might be some effect under Alternative A if grayling are listed as threatened or endangered

under the ESA. The No Action Alternative represents the status quo, whereas Alternatives B and C represent Agreements leading to the implementation of conservation measures across project areas of varying size. The planning process to be used under Alternatives B and C consider ecological, economic and social effects, with the final goal of implementing conservation plans that sustains and preserves the resource base. Thus, no significant social and economic effects are expected under either alternative.

### **(3) Recreation**

Fishing and hunting are the two primary recreational activities occurring within the proposed project area that have the potential to be affected by the proposed action or any of the alternatives. While rafting does occur in the Big Hole River within the proposed project area, most of it is done in the context of fishing. The Big Hole River is a low-gradient river with few stretches of white-water, so recreational rafting is comparatively less significant river use than angling from a raft and will not be considered in this analysis.

#### **Alternative A**

Under Alternative A (no action) the status quo should generally hold, and there should be no impact on fishing and hunting beyond current levels. Variable environmental conditions may prove either beneficial or detrimental to fishery and hunting resources. While the No Action Alternative is generally considered the default or null condition relative to the other alternatives, any human-mediated change to fishing and hunting under Alternative A would likely be negative. If current land and water use practices continue under Alternative A, then the impairments to the aquatic system (dewatering, thermal loading, and habitat and channel simplification) would likely continue and the effect on sport fishery resources in the river would be negative. Fishery resources in the Big Hole River are currently being impacted by the combined effects of drought and human-influenced habitat degradation (Magee and Lamothe 2004; Oswald 2005). Degraded physical habitat conditions also have lead to regulatory restrictions on the fishery. Angling restrictions in the upper Big Hole River have frequently been imposed during recent years because of low streamflows and high water temperatures. Low streamflows may preclude rafting access of certain river segments during summer months, and thus reduce access to the fishery.

The probability of listing fluvial Arctic grayling under the ESA is comparatively greatest under Alternative A. If fluvial Arctic grayling were listed, then regulatory restrictions may be imposed on the fluvial Arctic grayling fishery (currently catch-and-release) or the general sport fishery that may affect anglers targeting other species, such as brown trout, brook trout and rainbow trout.

The No Action Alternative is generally assumed to result in no impact to hunting resources. That is, hunting for big game, upland birds or waterfowl in the project area would remain unchanged from current levels. Variation in the quality of the resource

would primarily depend on how environmental conditions affected populations of game species. As with the fishery, any human-mediated effects to hunting resources would likely be negative under Alternative A because it assumes that current land and water use practices would continue. Game species that depend intimately on aquatic resources and/or riparian habitats might be affected where the No Action Alternative lead to continued impairment. The probability that aquatic and riparian habitats would be restored is much less under Alternative A compared with Alternatives B and C.

### **Alternative B**

Under Alternative B (Proposed Action) there should be beneficial effects for fishing and mostly no impact or beneficial effects for hunting. The implementation of conservation measures to benefit fluvial Arctic grayling also is expected to benefit other game fish species. Despite some temporary ground or substrate disturbance associated with the implementation of conservation measures under the Proposed Action, the net result should be an improvement to the structure and function of the aquatic ecosystem in the upper Big Hole River relative to current conditions. Instream flows should increase, riparian habitats would be protected or restored, barriers that fragment habitat would be removed, and entrainment in irrigation ditches should be reduced. Populations of fluvial Arctic grayling, brook trout, brown trout, and rainbow trout are expected to respond positively to these changes, thus the overall sport fishery resource would be improved. Angling closures would be less likely because improved habitat conditions should reduce the frequency of low streamflow and thermal loading that would otherwise necessitate regulatory action.

The overall effect of Alternative B on hunting should be nil or positive, but effects on individual game species may range from negative to positive depending on their habitat requirements. Riparian habitats are ecologically important for many species of wildlife (reviewed by Kauffman and Krueger 1984), so the proposed action should benefit those game species, for example elk and moose, which forage in and use riparian zones for migration corridors. Private lands in the proposed project area would remain in agricultural production, so little or no change from current population levels is anticipated for many game species. However, game species that use certain wetlands may be affected. Overirrigation and water loss from inefficient irrigation ditches has created "incidental" wetlands at some locations in the proposed project area. Alternative B may result in actions which reduce overirrigation and increase irrigation ditch efficiency, and reduce the size of or eliminate these incidentally-created wetlands. Waterfowl that use such habitats would have to relocate, so the spatial distribution of certain wetland-dependant game species may change under Alternative B. Alternative B is not expected to affect naturally-occurring wetlands.

### **Alternative C**

Under Alternative C (limited umbrella Agreement) there should be beneficial effects for fishing and mostly no impact or beneficial effects for hunting; but the scale of these effects would be reduced relative to Alternative B. In general, Alternative C should

result in beneficial effects for fish species that either reside in or seasonally utilize habitats in the Big Hole River between Wisdom Bridge and Little Lake Creek (Figure 1). Thus, the fishery in this section of the river should improve. However, this river segment's primary fishery resource is brook trout (and perhaps fluvial Arctic grayling) and anglers typically target brown trout and rainbow trout in downstream segments. Positive effects of conservation actions implemented under Alternative C may translate to improved aquatic habitat conditions downstream from the "limited" project area, but it is equally likely that such effects would be attenuated or counteracted by actions outside the area (i.e., nonparticipating landowners outside the limited project area that divert water "conserved" by actions in the limited project area unless flows were adequately protected through leases).

The overall effect of Alternative C on hunting should be nil or positive, and the effects on specific game species or habitats should be identical to that described under Alternative B but would be evident across a smaller spatial scale. It is not known if changed (improved) habitat conditions within the limited project area would affect the relative distribution of game species and hunting pressure in the watershed.

### **Summary**

All three alternatives should generally result in no negative impacts to the primary recreational activities in the upper Big Hole River watershed compared to current conditions. In order of beneficial effects to the primary recreational activities (hunting and fishing) on private lands in the proposed project, the three alternatives would be ranked as follows--(1) Alternative B, proposed action; and (2) Alternative C, limited umbrella Agreement. Alternative A (no action) is generally assumed to be neutral. Alternative B has the potential to improve physical habitat conditions for fishes over a large segment of river and should improve the sport fishery. Alternative B should generally have no effect or a beneficial effect on hunting. Beneficial effects would be most evident where game species respond positively to riparian habitat conservation and restoration. Alternative C would improve conditions in a specific segment in the watershed and should improve angling opportunities for brook trout and fluvial Arctic grayling. Alternative C should generally have no effect or a beneficial effect on hunting. Alternative A is the status quo which assumes no change to fishery and hunting opportunities; however, the perpetuation of existing land and water use practices might also lead to a decline in those resources where degradation of aquatic and riparian habitats continue.

### **I. Consideration of Changed Circumstances and Adaptive Management Provisions Under Proposed Action**

This EA analyzes actions that are reasonably certain to occur if the Alternative B, the Proposed Action (umbrella Agreement) were executed and implemented. However, the Proposed Action also includes a number of actions that are less likely to occur. These less likely actions are best characterized as potential responses to changed circumstances or adaptive management provisions, but are not formally analyzed in the present assessment



because--(a) such actions are already accounted for in the existing analysis as they represent an extension of Agreement's conservation strategy; (b) existing regulatory mechanisms are in place to ensure proper environmental review; (c) the Agreement presents a general approach or solution and any subsequent proposal for action would be subject to environmental review; or (d) there is little basis for environmental review. A summary of these actions, as well as their basis for environmental review, are presented below.

The Proposed Action presents provisions to deal with the changed circumstances of drought, floods, water rights adjudication, and impacts of nonnative species. An example of actions in response to a changed circumstance already accounted for in the existing analysis as they represent an extension of Agreement's conservation strategy would be possible actions to address drought consistent with the Agreement's conservation strategy whereby the participating agencies provide technical and financial assistance to landowners to reduce irrigation demands. An example of a response to changed circumstances where existing regulatory mechanisms are in place to ensure proper environmental review is if adjudication leads to an amendment, modification or revision of the Permit and Agreement to the extent that the existing conservation strategy is changed, then by the CCAA policy such a change would trigger review under applicable regulations. However, post-adjudication revision to any site-specific plans to ensure consistency between the plan and State water law would appear to be a formality and does not appear to constitute an action likely to affect the human environment. An example of changed circumstances where the Agreement presents a general approach or solution and any subsequent proposal for action would be subject to environmental review would be where the Proposed Action does not present any specific proposals to address threats from nonnative species. Subsequent specific proposals to deal with identified threats would be subject to applicable State and Federal regulations. An example of changed circumstances where there is little basis for environmental review would be the assessment of physical structures affected by floods. This does not appear to constitute an action likely to affect the human environment, so environmental review does not seem appropriate.

The Proposed Action also presents general adaptive management approaches to address threats to fluvial Arctic grayling from nonnative trout and transplant fluvial Arctic grayling within the project area if restoration targets are not being achieved. Any specific actions under these general guidelines are at the legal discretion of MFWP and would be subject to appropriate environmental review. For example, MFWP has the legal mandate to manage fishery resources in Montana and if it presented a proposal to suppress nonnative trout or translocate fertilized fluvial Arctic grayling eggs within the project area and within the context of the Agreement, such a proposal would be subject to environmental review under MEPA.

**Table 13. Summary of environmental impacts to the human environment.**

ENVIRONMENTAL PARAMETER	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Fluvial Arctic Grayling	Fluvial Arctic grayling likely to remain at low abundance, but some localized habitat improvements may result in population increases.	Fluvial Arctic grayling abundance & distribution likely to increase across watershed in proportion to landowner participation.	Fluvial Arctic grayling abundance & distribution likely to increase, but at a lesser spatial scale than Alt B because of localized project area.
Hydrology	Largely status quo – system's hydrology would remain altered by extensive irrigation diversions.	Reduced irrigation withdrawals across a large area would move river system to a more natural hydrograph & flow regime, with increased instream flows & reduced thermal loading.	Certain river segments in project area would experience improved instream flows, but irrigation withdrawals at existing levels outside project area would likely maintain hydrologic alterations across a greater area.
Vegetation	Largely status quo – alteration of plant communities on rangeland, hay fields & pastures, & in riparian zones would continue to result in degraded conditions except in locations where specific restoration projects are being implemented.	No impact or positive effects for native vegetation, because native vegetation may be protected or restored. Some impacts to existing agricultural species composition where restoration activities or changes in land or water use are required.	Effects same as for Alt B, except at a smaller spatial scale.
Wetlands	No significant impact. Incidental wetlands sustained by overirrigation would persist.	No significant impact to natural wetlands, but some incidental wetlands sustained by overirrigation may be affected	Effects same as for Alt B, except at a smaller spatial scale.
Fishes	Degraded habitat conditions would likely persist & may favor more tolerant, introduced species.	Hydrologic & riparian (streamside vegetation) improvements should improve habitat conditions for most fishes in project area.	Localized hydrologic & riparian improvements may benefit species likely to occur or utilize habitats in those specific areas.
Wildlife	Mostly no significant impact, but local benefits possible where specific restoration projects are being implemented.	Improved terrestrial & aquatic habitat conditions would result in no significant impact or benefits to most wildlife species. Species using riparian zones would especially benefit.	Effects same as for Alt B, except at a smaller spatial scale.
Listed species of wildlife	No significant impact, but localized benefits possible where specific restoration projects are being implemented.	Either a beneficial effect or no significant impact.	Similar to Alt B, but benefits at a smaller spatial scale.
Cultural resources	No impact other than existing (agricultural) land use.	No impact – ground-disturbing activities require EA & Montana SHPO consultation, as necessary.	No impact – ground-disturbing activities requires EA & Montana SHPO consultation, as necessary.
Local communities and economies	Increased potential for ESA listing of fluvial Arctic grayling may pose social and economic threats	Increased stability for local communities & its economy because--a) protection of fluvial Arctic grayling would reduce likelihood of ESA listing of fluvial Arctic grayling, b) regulatory assurances under Agreement would remove disincentive to cooperate in fluvial Arctic grayling conservation. Cost-share possible for conservation projects.	Likelihood of ESA listing of fluvial Arctic grayling greater than in Alt B (but less than in A) because of restricted project area. Positive effects for participants would be similar to those in Alt B, but economic threats would remain for landowners outside the project area if fluvial Arctic grayling were listed.
Recreation	No impact.	Either a beneficial effect or no significant impact. Recreational fishery should improve.	Similar to Alt B, but benefits at a smaller spatial scale. Recreational fishery may improve, but not necessarily for all salmonid species.

**Table 14. Summary of MEPA criteria used to determine significance of impacts under the proposed action (Alternative B).**

Significance Criteria	(a) severity, duration, geographic extent, & frequency of occurrence of impact	(b) probability that impact will occur if proposed action occurs; or conversely, reasonable assurance in keeping with potential severity of an impact that impact will not occur	(c) growth-inhibiting aspects of impact, including relationship or contribution of impact to cumulative impacts	(d) quantity & quality of each environmental resource or value that would be affected, including uniqueness & fragility of those resources or values	(e) importance to State & society of each environmental resource or value that would be affected	(f) any precedent that would be set as a result of an impact of proposed action that would commit department to future actions with significant impacts or a decision in principle about such future actions	(g) potential conflict with local, State, or Federal laws, requirements, or formal plans
Fluvial Arctic Grayling	20-year Agreement duration, with expected extension. Long-term benefits to grayling abundance & distribution in Big Hole River.	Without implementation of proposed action, expectation is that status of grayling will remain unchanged, without benefits of proposed action.	None	Upper Missouri fluvial Arctic grayling are last native fluvial population in continental U.S. They are a Montana Species of Concern. Proposed action will improve status & assure long-term of this native species.	Fluvial Arctic grayling is a Montana Species of Concern & an ESA candidate species.	None	None
Hydrology	Long-term benefits to natural river function, temperature profile & flows in Big Hole River by reducing irrigation withdrawals.	Significant benefits to river function & flows are very likely to occur; less likely or will not occur without Agreement.	None	Significant improvements to Big Hole River hydrology will improve instream habitat for resident fish including grayling.	Accrued benefits will reduce probability that water withdrawal restrictions will be imposed & recreational angling will be suspended under Montana Drought Plan.	None	None
Vegetation	No or minor beneficial impacts to native vegetation on enrolled properties. Minor impacts from changes to existing vegetation communities.	More productive vegetative communities on agricultural lands & revegetation of riparian zones will result from proposed actions.	None	Primary benefit will be reestablishment or expansion of native riparian vegetation.	Changes to vegetation community have potential to improve productivity of agricultural lands. Restoration of riparian vegetation will restore natural function & fish & wildlife habitat of Big Hole River.	None	None
Wetlands	No significant impacts to natural wetlands.	None	None	Not applicable	Not applicable	None	None
Fishes	Long-term benefits to abundance & distribution of all fishes in Big Hole River.	Without implementation of proposed action, expectation is that status of resident Big Hole fishes will remain unchanged.	None	Proposed action will improve abundance of native & non-native game fish species.	Fisheries & angling opportunities in Big Hole River should improve.	None	None
Wildlife	No significant impacts to terrestrial or aquatic wildlife.	Wildlife will primarily benefit from improvements to riparian habitats from proposed action.	None	Minor benefits to wildlife using riparian areas.	There are no anticipated significant impacts from proposed action.	None	None

Significance Criteria	(a) severity, duration, geographic extent, & frequency of occurrence of impact	(b) probability that impact will occur if proposed action occurs; or conversely, reasonable assurance in keeping with potential severity of an impact that impact will not occur	(c) growth-inhibiting aspects of impact, including relationship or contribution of impact to cumulative impacts	(d) quantity & quality of each environmental resource or value that would be affected, including uniqueness & fragility of those resources or values	(e) importance to State & society of each environmental resource or value that would be affected	(f) any precedent that would be set as a result of an impact of proposed action that would commit department to future actions with significant impacts or a decision in principle about such future actions	(g) potential conflict with local, State, or Federal laws, requirements, or formal plans
Listed Species of Wildlife	No significant impacts anticipated for listed species.	Likely	None	Bald eagles may benefit from increased prey base (fish).	Bald eagles are a Montana Species of Concern.	None	None
Cultural Resources	No impact – ground-disturbing activities will require EA & Montana SHPO consultation as necessary	Not applicable	None	None	None	None	None
Local Communities & Economies	No significant impacts. Participating landowners benefit from ESA regulatory relief.	Regulatory relief for Participating Landowners more likely under proposed action.	None	Participating Landowners receive ESA regulatory relief & participate in conservation/restoration of fluvial Artic grayling.	Support of agricultural communities and conserving grayling are important to Montana. Both benefit from proposed action.	None	None
Recreation	Long-term improvement to recreational angling in Big Hole River. Minor impacts to hunted.	Increases in abundance of game fish species probable. Possible benefit to wildlife (elk & moose) that utilize riparian areas. Possible minor impacts to waterfowl that have used incidental wetlands.	None	Angling opportunities are expected to improve significantly. Minor impacts to wildlife (+ for big game species, - for waterfowl) are expected to be limited.	Recreational angling in Big Hole River is a resource of major State & national importance. Minor impacts to wildlife will have little noticeable affect.	None	None

## **V. CUMULATIVE EFFECTS**

Cumulative effects include the impacts on the environment which result “from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

There are numerous non-Federal actions that are ongoing or will occur in the future; however, the locations of individual enrolled property owners will not be known until the Agreement becomes operational and willing landowners come forward to participate in the program. However, since April 2005, over three dozen landowners collectively owning more than 200,000 acres of private lands in the proposed project area have formally expressed their willingness to MFWP to participate in a CCAA to benefit fluvial Arctic grayling, should such a CCAA be executed and implemented. While the actual distribution or total acreage of lands that would be enrolled during the 20-year period of the Agreement cannot be predicted, the MFWP would not issue a CI to any non-Federal landowner if it is determined that ongoing or future actions at the site may compromise the efforts to improve habitat for Arctic grayling.

The following analysis addresses the potential cumulative effects from the proposed action and its alternatives when added to the past, present, and reasonably foreseeable future actions in the project area emphasizing actions on private and State lands in the project area that would be eligible to enroll in a CCAA.

### **A. Fluvial Arctic Grayling and Other Fish Populations**

Under Alternative A, the No Action Alternative, agricultural and ranching activities would continue within the Project Area in accordance with applicable laws, with the predominant land use being irrigated agriculture for hay production and livestock. These activities have cumulatively led to fluvial Arctic grayling habitat degradation, fragmentation and loss. Factors such as angling exploitation, overfishing, and introduction of non-native salmonid fishes, in combination with the above-mentioned habitat-related impacts, have contributed to declining numbers of fluvial Arctic grayling. Although various State, Federal, and private groups, including MFWP, USFWS, NRCS, MDNRC, the Big Hole Watershed Committee, the Big Hole River Foundation, and Trout Unlimited have promoted, implemented or otherwise been involved in efforts to improve habitat conditions for fluvial Arctic grayling in the project area, coordinated actions have not been conducted on a large scale. Continuance of the *status quo* under Alternative A would most likely lead to continued habitat degradation and a continued decline in grayling population numbers. The potential for listing under the No Action Alternative is greater than under the Action Alternatives and if listed, over time, would have economic, legal and social repercussions for affected individuals.

Cumulative effects under Alternative B and to a lesser extent under Alternative C would be related to management actions taken by up to 318 non-Federal property owners under Alternative B and by up to 131 owners under Alternative C to conserve fluvial Arctic grayling at various sites throughout the project area. These actions that would generally be habitat improvements that would benefit the grayling include--1) improving of instream flows; 2) conserving or restoring of riparian habitats, 3) removal of barriers to fluvial Arctic grayling movement; and 4) addressing entrainment threats. These management actions would likely occur at more sites under the Proposed Action Alternative B than under Alternative C due to that alternative's greater likelihood for attracting landowners into collaborative grayling conservation measures under the Agreement.

There are likely two types of cumulative positive effects that could occur under Alternatives B and C--(1) approval of agreements under any of the alternatives could result in other landowners developing similar agreements in the future; and (2) changes through time in habitats, and in fluvial Arctic grayling and other fish populations, would occur from implementation of conservation measures at certain sites under any alternative.

For the first type of likely positive cumulative effects, under either Alternative B or C, if an agreement and site-specific plans are approved, and permits are issued to individual Participating Landowners, it is reasonable to foresee other landowners who are interested in fluvial Arctic grayling conservation, and/or desire ESA regulatory assurances, entering in to similar agreements with the agencies. Cumulative effects beneficial to conservation of the grayling could occur on lands throughout the estimated 382,200-acre project area, (approximately 130,000 acres under Alternative C), from conservation measures being implemented by other landowners who enter into similar agreements. Effects from other landowners implementing similar conservation measures would be positive, in fact, should similar conservation measures be implemented on all necessary properties throughout the range of the species. Projects representative of those that would be implemented at a larger scale under the CCAA have been implemented or are ongoing in the Big Hole River watershed. For at least the past decade, MFWP and the USFWS Partners program have engaged Big Hole River valley landowners in small-scale restoration projects to benefit fluvial Arctic grayling. In both 2004 and 2005, the NRCS has utilized special initiative EQIP programs to provide technical and financial assistance to producers willing to implement both short- and long-term practices to improve habitat conditions for fluvial Arctic grayling in the Big Hole River.

For the second type of likely positive cumulative effects, under Alternatives B or C, cumulative positive impacts would be expected to occur over time as a result of an increase in the quantity and quality of suitable habitat for grayling and other fish species at sites where grayling habitat conservation measures are implemented. The extent of suitable fluvial Arctic grayling habitat would be expected to increase from additional landowners implementing similar agreements, and habitat quality would be expected to improve over time from habitat improvements implemented to conserve fluvial Arctic grayling. These positive cumulative impacts would likely occur beyond the 20-year duration of the Proposed Action Alternative B since habitat improvements would be expected to extend over a longer

period of time. These positive cumulative effects are expected to contribute to the recovery and sustainability of fluvial Arctic grayling in the proposed project area and also to benefit other fish species that have similar habitat requirements.

The introduction of nonnative trout species has been cited as a secondary reason for decline of fluvial Arctic grayling in the Big Hole River. Actions taken under Alternatives B and C are generally designed to improve aquatic habitats and benefit fluvial Arctic grayling but may have a positive effect on other fishes, including nonnative trout. Since some uncertainty exists as to whether competition and predation by nonnative trout species are important mechanisms presently influencing the population status of native fish species in the project area, it is difficult to predict what the cumulative effects would be of increased numbers of nonnative fishes on fluvial Arctic grayling or other native fishes in the project area. Abiotic (habitat) conditions are currently perceived to be a more significant influence on native fishes in the project area than competitive interactions (biotic), but if the proposed action removes some of these abiotic limitations (i.e., dewatering, thermal loading, etc.) then biotic factors may come to play a more significant role. Monitoring the status of the fisheries over time would play a determining role in whether other actions may be necessary to address threats by nonnative trout populations if they are having a detrimental effect upon the status of native fish populations.

## **B. Hydrology**

Cumulative effects to water quality and quantity, which have been severely degraded from past land management practices, should improve under the Proposed Action Alternative B and to a lesser extent under Alternative C, and would either not change or continue to degrade under the "No Action" Alternative A. More water would remain in the natural river channel leading to a more "natural" flow regime which would help hydrological and ecological processes. This process would be much more pronounced under Alternative B as conservation measures would be implemented along contiguous river segments leading to more widespread hydrologic benefits. Improvements in the hydrology of the stream and to riparian habitats would in turn improve water quality and quantity. For example, existing thermal impairments in the mainstem Big Hole River should be reduced by increased instream flows, functional riparian habitats, and longer-term adjustments in channel form.

Adjudication of claimed rights under Montana water law may interact with the effects of the three alternative actions. The past and present condition is that the Big Hole River system is overallocated, meaning that claimed water rights typically exceed water availability. Water adjudication is expected to occur within the next 20 years, presumably when the Agreement would be in effect. The adjudication process is anticipated to reduce the extent of overallocation, but it is unknown if it would be completely eliminated. Overall, adjudication is expected to increase streamflows above current levels. Relative to adjudication, the cumulative effects of Alternatives B and C, which propose to implement water conservation measures for participating landowners in addition to compliance with claimed or adjudicated water rights, should be additive and positive for hydrologic conditions and result in increased water quantity (instream flows) and water quality (reduced thermal loading).



Alternative A can have some (positive) or no cumulative effects relative to adjudication depending on the number of landowners who take specific actions to reduce irrigation demands and improve instream flows in addition to those changes effected by adjudication.

### **C. Vegetation**

Under the No Action Alternative (A), vegetation communities would remain the same or continue to degrade over time unless the larger-scale conservation actions were taken to reverse this situation. Cumulatively, this would be expected to affect the riparian zone resulting in continued degradation of habitat for fluvial Arctic grayling and other fish species. The cumulative effects of implementing either Alternatives B or C would result in beneficial effects over time to the native vegetation. Some changes in vegetation may occur, through re-establishment of native plants in areas that currently support nonnative plants. Upland, native dry-land plants would become more abundant and widely distributed because of decreased irrigation in some of these areas. Overall, these alterations, over time, would benefit wildlife dependent on these species of plants.

### **D. Wetlands**

Under Alternative A, irrigation practices in the upper Big Hole River watershed have facilitated the spread of hydrophytic (wetland-adapted) plant species into locations with topography generally not conducive to these species, such as benches or on slopes. Under the **status quo** this phenomenon would continue resulting in the maintenance of existing and creation of additional incidental wetlands. Presumably, this has had the unintended positive result of providing additional habitat for migratory birds. The extent of incidental wetlands, as well as those incidental wetlands that may be affected by the Agreement, is presently unknown. However, it appears that the cumulative effects of the action Alternatives B and C would be to promote habitat conditions more characteristic of the natural topography and hydrology at those locations. Incidental wetlands would gradually disappear and wildlife now using those wetlands are expected to shift back to utilization of natural wetland habitats.

### **E. Wildlife**

The cumulative effect of the action Alternatives B and C over time on other wildlife also should be positive. Riparian-dependent species should benefit from improvements to the riparian zone. Bald eagles would experience an increase in forage due to an increase in the number of fish available. Some migratory bird species may have actually experienced benefits from past land and water management practices which would continue under Alternative A since they have led to the creation of incidental wetlands utilized by many of these birds. With implementation of conservation measures under Alternatives B and C, migratory birds may experience some impact with the loss of these wetlands, but over time they are expected to relocate to existing or restored natural wetlands which would have beneficial cumulative effects on all avian species migrating through the project area.

## **F. Social And Economic Considerations**

### **(1) Local Communities and Economies**

The cumulative effects of the No Action Alternative on socio/economic parameters are based on the likelihood of listing the fluvial Arctic grayling under the ESA. If current land management practices were to continue Arctic grayling populations would continue to decline. The listing of fluvial Arctic grayling under the ESA is perceived by residents of the Big Hole as a significant threat to their livelihoods because of the potential for regulatory enforcement actions to disrupt their accustomed ranching activities. The overall effect of an ESA listing on the local community in the affected area cannot be known with certainty, but would most likely result in some situations of at least temporary economic hardship or possibly changes in land use or ownership because of the possibility of take of fluvial Arctic grayling from diversion of surface water or entrainment in irrigation ditches.

Even without the threat of listing under the ESA, current land management practices may be ecologically unsustainable as drought conditions continue to diminish water supplies needed to continue current irrigation practices. Over time, these practices may lead to economic hardships due to loss of resources needed to sustain current land management practices.

The cumulative effects of implementation of conservation practices under Alternatives B and C would allow for more economically and ecologically sustainable ranching practices. Expenses to implement these practices would be defrayed, to the extent possible, by State and Federal funding programs. Landowners may expect some financial investment where funding programs require cost-share from participants or where a participant's income exceeds program criteria and precludes participation. Over time this outlay should be justified by more efficient utilization of resources leading to more economically and ecologically sustainable ranching operations.

### **(2) Recreation**

The cumulative effects of Alternative A on recreational fishing should be negligible or negative. Although past fishing practices may have contributed to the status of fluvial Arctic grayling in the upper Missouri River, habitat degradation is believed to be the primary factor threatening the species in the Big Hole River. Continued degradation of the environment would lead to continued loss of angling opportunities and may lead to an increased frequency of fishery closures in the upper Big Hole River following MFWP's management guidelines. If ongoing habitat degradation contributes to the listing of fluvial Arctic grayling under the ESA, then it is possible that Federal regulations also may limit or restrict angling. Implementation of Alternative B and to a lesser extent Alternative C over time would lead to improvements to instream flow and riparian habitat. This would in turn lead to improved angling not only for fluvial Arctic

grayling but for other salmonid species. Additionally, improved recreational angling opportunities may have a positive effect on the economy by increasing the number of anglers to the area who would spend money on goods and services.

## **G. Federal Lands**

Cumulative effects of interactions between land management activities on Federal lands and the three alternatives are considered independently from those in the preceding sections, which considered cumulative effects on private and State lands in or adjacent to the proposed project area (and are eligible to enroll in CCAAs). Approximately 67% of the entire Big Hole River watershed is owned by the Federal government (58% USFS, 9.4% BLM, and 0.04% NPS) and 3.4% is owned by the State of Montana. In the upper watershed, USFS holdings remain significant but lands held by the State of Montana comprise a comparatively greater percentage of the upper watershed area than those held by the Bureau of Land Management though their overall extent is much less than USFS lands (Figure 6 this EA; see draft CCAA, MFWP et al. 2005, 2006, Figures 5 and 6). Analysis of cumulative effects focuses primarily on aquatic resources (water quality and quantity and fisheries). No direct cumulative effects on vegetation, wetlands, wildlife, cultural resources, local communities and economies, and recreation are expected unless specifically noted.

### **NATIONAL FOREST LANDS – BEAVERHEAD DEERLODGE NATIONAL FOREST**

Approximately 58% of the Big Hole River watershed is owned by the USFS and is part of the BDNF. The BDNF lands are adjacent to the proposed project area in some locations. Thus, it is likely that past, present and future activities in BDNF have affected and would continue to influence environmental conditions in the proposed project area. While forest management activities may influence a range of environmental attributes outside the forest, the proposed action deals primarily with how land use affects the physical template for fluvial Arctic grayling. Aquatic systems are inherently linked such that upstream processes affect conditions downstream and vice versa. Thus, the present cumulative effects analysis focuses on how general land management practices (particularly grazing) in the BDNF affect hydrologic function and aquatic resources, and is further appropriate because aquatic resource conditions integrate effects of watershed-scale land management. The analysis also would consider if general management strategies employed by the BDNF are consistent with the proposed Agreement and the other two alternatives.

The existing BDNF forest management plan (Beaverhead Forest Plan) was approved in 1986 but is currently being revised. The general goal of the existing Beaverhead Forest Plan is “to maximize present net value while responding to the range of resource use demands and concerns of the public who utilize the Beaverhead National Forest land and resources” (USFS 1986, II-40). The existing plan includes a number of aims with regard to aquatic resources. For example, the planners recognized that “the fishery streams in the Forest are important for the recruitment of fish to the downstream fisheries both on and off the Forest” (USFS 1986, II-22). Among the goals of the Beaverhead Forest Plan are those to “ensure a high degree of water quality and sufficient water quantity in on-Forest streams to protect fisheries habitat, water based recreation, municipal water supplies, and downstream uses in

accordance with State of Montana Water Quality Standards,” and “provide opportunities for use of forage by domestic livestock at or above current permitted levels of use while protecting and enhancing fishery habitat, riparian areas, recreation and other forest resources”(from 1986 Beaverhead Forest Plan as quoted in FEIS Beaverhead Forest Plan Riparian Amendment, USFS 1997, III-1). The Beaverhead Forest Plan acknowledges that land use activities such as livestock grazing and timber harvest have the potential to adversely affect water resources, and requires that the BDNF use Best Management Practices (BMPs) “... where potential impacts [to watersheds and soils] are identified” (USFS 1986, III-23) and “in all [grazing] allotment management activities to protect soils and water quality” (from 1986 Forest Plan as quoted in 1997 Beaverhead Forest Plan Riparian Amendment FEIS, USFS 1997, III-2). The Beaverhead Forest Plan designates westslope cutthroat trout and Arctic grayling among the 11 “wildlife indicator species” on the Forest (USFS 1986, III-18).

A 5-year review of the existing Beaverhead Forest Plan published in 1993 indicated that existing conditions for riparian areas were not as good as expected during forest planning and that existing standards were not sufficient to meet goals for fisheries, wildlife and forest resources (USFS 1997). Specifically, “the existing condition of the forest’s riparian areas is significantly poorer than was assumed in the development of the of the Forest Plan” (Beaverhead Forest Plan Five-year Review 1993, as cited in FEIS Beaverhead Forest Plan Riparian Amendment, USFS 1997, III-15) and further that “monitoring (of riparian areas) has shown that the forage utilization standard is not protecting riparian dependent resources as specified...” by the Beaverhead Forest Plan (Beaverhead Forest Plan Five-year Review 1993, as cited in FEIS Beaverhead Forest Plan Riparian Amendment, USFS 1997, III-15). Livestock effects on stream channels (e.g., widening through bank trampling) were commonly cited as a reason contributing to non-functioning or functioning-at-risk (USFS 1997). On BDNF lands “The cumulative impacts of non-native fish interactions and reductions in fish habitat quantity and quality from land management activities have caused a decline, and in some drainages, the loss of native [fish] populations. Impacts from timber harvesting, mining, grazing, and recreational activities have been detrimental to fish densities and have created competitive disadvantages for westslope cutthroat trout. ... Widespread fish stocking in rivers and streams, a practice no longer done by the state in southwestern Montana, resulted in severe reductions or loss of cutthroat trout and river grayling populations” (USFS 1997, III-15). In response, the BDNF amended the Beaverhead Forest Plan to include “a forest-wide goal for riparian function, measurable objectives for riparian function, and utilization standards for riparian vegetation to be used unless/until site-specific analysis has generated different standards” (USFS 1997, I-1). The BDNF also has been actively involved in restoration and planning efforts for westslope cutthroat trout and fluvial Arctic grayling (USFS 1997).

The BDNF is currently revising the Beaverhead Forest Plan (USFS 2005a) (draft forest plan revision), and a final plan should be adopted in late 2005 or early 2006. With respect to aquatic resources, the draft forest plan revision provides forest-wide objectives for attributes including watersheds, stream channels, instream flows, riparian areas and habitat. The following objectives were excerpted from the draft forest plan revision (USFS 2005a, pp. 11-13).

**Watersheds:** Maintain and restore watersheds to insure water quality, timing, and yields necessary for healthy riparian, aquatic ecosystems, and wetlands. Provide water chemistry and temperature that support native aquatic species reproduction and survival. Develop site-specific criteria for managing municipal watersheds, and restoring degraded water to meet goals of the Clean Water Act and Safe Drinking Water Act. Ensure management actions are consistent with TMDLs. Where waters are listed as impaired and TMDLs and Water Quality Restoration Plans are not yet established, ensure management actions do not further degrade waters, but promote water quality restoration to support beneficial uses.

**Stream Channels:** Maintain and restore stream channel attributes and processes to sustain desired riparian, wetland and aquatic habitats and keep sediment regimes as close as possible to those with which riparian and aquatic ecosystems developed.

**Watersheds and Instream Flows:** Improve and protect watersheds and secure in-stream flows to support healthy riparian, aquatic habitats, and stable and effective stream function, including the ability to route in-channel flows.

**Floodplains:** Maintain and restore the condition of floodplains, channels, and water tables to dissipate floods and sustain the natural timing and variability of water levels in riparian, wetland, meadow and aquatic habitats.

**Riparian Habitat:** Maintain and restore habitat to support viable, well distributed populations of native and desired non-native plant, invertebrate, and vertebrate aquatic- and riparian-dependent species. Maintain and restore movement corridors within and between watersheds, where desired, to provide aquatic-dependent species' habitat needs and maintenance of metapopulations.

**Aquatic Nuisance Species:** Prevent new introductions of aquatic nuisance species in riparian and aquatic habitats. Where aquatic nuisance species are adversely affecting the viability of aquatic native species, we would work cooperatively with appropriate State, Federal agencies, and other stakeholders to reduce or eliminate impacts.

**Channel Integrity:** Maintain and protect channel integrity, stability, and beneficial uses.

The associated Forest Aquatic Strategy presents a suite of standards to implement the proposed objectives, with special emphasis on riparian habitats and protecting westslope cutthroat trout (and bull trout *Salvelinus confluentus*).

The Draft EIS (DEIS) for the Beaverhead-Deerlodge Forest Plan Revision, analyzes how timber harvest and vegetation management for the five alternative (forest plan) actions would affect threatened, endangered and sensitive fish species, and concludes that "Alternatives 3 (Proposed Action), 4 and 5 (DEIS Preferred Alternative) provide the most comprehensive strategies for conserving westslope cutthroat, bull trout and fluvial arctic grayling, because of their comprehensive, prescriptive standards and because they identify Key Watersheds" and "There are no special provisions for grayling in Alternative 1. In Alternative 2, where grayling are present and stream conditions do not meet stream

objectives, new projects must have no impact or a beneficial impact on grayling to be implemented” (USFS 2005b, p. 202). In the corresponding analysis for grazing impacts on aquatic resources, the DEIS recognizes the influence of livestock grazing on aquatic systems, and States “Watershed conservation practices and updated grazing standards designed to protect water quality and riparian areas, where needed, will be included in allotment-management plans as they are revised and updated” (USFS 2005b, p. 196). Moreover, the DEIS concludes that [under any alternative] “Grazing management in the Ruby River and the Big Hole River drainages are sufficient to promote stream and watershed recovery, to benefit grayling” (USFS 2005b, p. 218). In the cumulative effects analysis for threatened, endangered and sensitive species, the DEIS notes that other land-management entities in the Big Hole River watershed have provisions to address fish habitat concerns, for example “Land Management practices as described in the Draft BLM resource management plan for the Dillon Resource Area, should lead to improved conditions for westslope cutthroat trout and arctic grayling (USFS 2005b, p. 226). Overall, the DEIS concludes that “Management actions on the BDNF will not result in any irreversible or irretrievable effects to westslope cutthroat, bull trout or fluvial arctic grayling” (USFS 2005b, p. 227).

Two specific issues also warrant mention under the cumulative effects--barriers to fish movement and effects of fire suppression. Alternative B (Proposed Action) and Alternative C (limited CCAA) in this EA call for the removal of barriers to fluvial Arctic grayling in the project area. Removal of barriers to benefit fluvial arctic grayling may conflict with management strategies to isolate populations of westslope cutthroat trout to protect them from invasion by nonnative trout. However, the Proposed Action requires a site-specific assessment where barrier removal is considered to benefit fluvial Arctic grayling, with the stated purpose of avoiding adverse impacts to westslope cutthroat trout (MFWP et al. 2005, 2006). Consequently, no cumulative effects to other sensitive fish species in the project area are expected with respect to the removal of barriers to benefit fluvial Arctic grayling.

The legacy of fire suppression beginning in the early 1900s in the BDNF has led to fuel build up and an increased probability for severe wildfires. If such fires did occur, resulting erosion and decrease in water quality would be expected to negatively affect water quality downstream and may be detrimental to fluvial Arctic grayling in the project area. While the potential cumulative effect of such a fire is negative, the Agreement does provide a general strategy to mitigate population-level impacts to fluvial Arctic grayling under changed circumstances.

## SUMMARY

Although USFWS is not aware of any specific instances, it is likely that implementation of the existing forest plan (adopted in 1986), when added to management practices on non-BDNF lands has cumulatively affected aquatic resources in the proposed project area for the fluvial Arctic grayling CCAA. However, amendments to the existing plan (e.g., for

new riparian standards) and forest management objectives stated in the 2005 draft forest plan revision indicate that land management activities causing impairment to aquatic resources are being addressed and ameliorated at the programmatic level.

The direction of the forest plan revision indicates positive cumulative effects might be expected for Alternatives B and C considered in this EA. The draft forest plan revision appears to be consistent with the intent of the CCAA with respect to aquatic resources, including direction that management must insure watersheds provide water quality, timing, and yields necessary for healthy riparian, aquatic ecosystems, and wetlands. Thus, positive cumulative effects to water quality and quantity, channel morphology, instream flows, and resident fishes (including fluvial Arctic grayling) are expected for Alternatives B and C in this EA. Cumulative effects as a result of the draft forest plan revision for Alternative A (No Action) may be neutral or positive for these same resources depending on the extent of landowners participation in efforts to conserve fluvial Arctic grayling in the absence of ESA regulatory assurances.

In conclusion, it is very difficult to explicitly consider how all the past, present, and future management actions in the BDNF interact with the alternatives considered in this EA given lack of site-specific data and the unknown level of actual participation in the Agreement. However, the general direction of forest management in the BDNF, which includes substantial land holdings in the Big Hole River watershed, indicates little potential for negative cumulative effects under any of the three alternatives in this EA, and the real potential for positive cumulative effects for aquatic resources, especially under Alternatives B and C.

## BUREAU OF LAND MANAGEMENT

The BLM Dillon Field Office completed a Proposed Dillon Resource Management Plan and Final EIS (FEIS) in 2005 that includes alternatives for resource management alternatives on all but 12,380 acres of the approximately 169,000 acres BLM lands in the Big Hole River drainage (BLM 2005). These 12,380 acres are managed under the BLM's 1983 Headwaters Resource Area Resource Management Plan, but are outside of the Project Area for the Agreement (BLM 1983).

The goal for managing aquatic resources under the proposed alternatives presented in the 2005 FEIS is to restore and maintain the chemical, physical and biological integrity of waters within BLM lands to protect beneficial uses. The desired future condition (after 20 years) is that all waters provide water quality and quantity sufficient to meet State of Montana standards and to protect or restore beneficial uses. Stream channels should display the dimensions, pattern and profile that are representative of site potential to allow floodplain aquifer recharge, moderate stream flows and buffer the effects of flooding.

The management goals for managing fish, riparian vegetation and water resources under the Resource Management Plan would be consistent with the goals of the Agreement. While some impacts from existing condition and management practices would continue under the proposed alternative, emphasis is provided to improving the land management practices on and condition of lands adjacent to streams containing grayling and to improving instream habitat for grayling.

Under the proposed alternative (Alternative B) in the BLM's FEIS, fish habitat would be managed for resident coldwater species that are of high economical, social, or scientific values (BLM 2005). Aquatic habitat would be managed to support a diversity of plant and animal communities. Class I (blue ribbon) fish habitat and westslope cutthroat trout habitat would be managed to achieve Western Montana Standards for Rangeland Health and to achieve potential or an upward trend in habitat condition within 15 years. Water leases and improved water management would be pursued to benefit westslope cutthroat trout and fluvial Arctic grayling. Projects to improve habitat to benefit fisheries would be implemented. The goal for managing riparian vegetation and wetlands under the proposed alternative is to restore riparian wetland areas so that at least 906 miles of streams are in proper functioning condition.

Based on information contained in its FEIS for the Resource Management Plan covering the Big Hole River watershed, the BLM's goals for managing fish, riparian vegetation and aquatic resources are consistent with the goals of the Agreement. Thus, these objectives would be expected to have positive cumulative effects for aquatic resources (water quality and quantity, riparian vegetation, stream morphology, and fishes including fluvial Arctic grayling) when considered in conjunction with both Alternatives B (Proposed Action) and C (limited umbrella Agreement) in this EA. However, existing conditions on BLM properties may create a lag before such positive effects would be evident. Cumulative effects from Alternative A (No Action) in this EA to these resources may range from negative to positive depending on the extent and effectiveness of conservation measures implemented by landowners to benefit fluvial Arctic grayling in the absence of an Agreement.

#### NATIONAL PARK SERVICE – BIG HOLE NATIONAL BATTLEFIELD

The Big Hole National Battlefield (Battlefield) is located upstream of the Project Area on the North fork of the Big Hole River and is administered by the NPS. The primary purpose of the Battlefield is to provide information on the Nez Perce Indian wars of the 1870s. Fishing is allowed within the park and is regulated by the State of Montana. Improvements to the hydrology downstream may provide some benefits upstream in the way of improved fisheries and habitat. The USFWS is not aware of any current land management practices by private landowners, or those proposed under Alternatives B and C, that have a significant impact on the human environment at the Battlefield. The Nez Perce National Historic Park General Management Plan (NPS 1997) which includes the Battlefield includes the statement, "There is a desire to get rid of exotic species and noxious weeds, returning the land to native or historic vegetation. As part of the General management Plan, a *Vegetation Management Plan* for the Nez Perce National Historic Park and the Battlefield was developed (NPS 2002) which promotes that vegetation should be in as "natural a condition



as possible" in order to preserve the historic view shed. The goal is to return the area to a condition that is as close as possible to the vegetation which existed at the time of the 1877 Battle of the Big Hole. This would be consistent with the desired condition for vegetation in the Project Area under Alternatives B or C and cumulatively would have a beneficial effect on the hydrology in the Project Area. The General Management Plan also considers it a priority to avoid impacts to species of special concern and one of its action items involves: "Surveys for special concern species will be conducted, and any mitigation needed to avoid impacts on such species will be implemented" (NPS 1997). Thus, cumulative effects to fluvial Arctic grayling (a species of concern) should be negligible with respect to the three alternatives considered in this assessment.

## **H. Other Parameters**

The USFWS is not aware of any past, present or future actions that would interact over time with any of the alternative actions to result in cumulative effects to geology, air quality, cultural and historic resources, and visual resources.

# **VI. COMPLIANCE, CONSULTATION, AND COORDINATION WITH OTHERS**

## **A. NEPA Coordination and Environmental Evaluation Conducted by the Agencies**

The Proposed Action is a programmatic Agreement, and this Programmatic EA analyzes the general effects of this Agreement and to determine the significance of any resulting impacts. Private landowner interest in the Proposed Action is apparently substantial, but the actual participation is presently unknown. Without specific knowledge of the properties involved and data on baseline conditions, it is not possible to analyze site- or property specific effects of the Proposed Action at this time. The effect of any plan or project proposed under a site-specific plan to be implemented under the Proposed Action would be subject to environmental review by the involved agencies to ensure such actions comply with appropriate State and Federal laws.

## **NATURAL RESOURCES CONSERVATION SERVICE**

The NRCS is a Federal agency and its actions must comply with NEPA. The NRCS has conducted a national-level NEPA analysis of its planning process which would be used under the Proposed Action. The NRCS also is responsible for conducting environmental analyses on any aspect of a site-specific plan (under the Agreement) over which they have responsibility for planning, funding, or implementing.

An Environmental Evaluation would be conducted by NRCS on every conservation plan developed on an individual farm or ranch to document the resulting environmental effects (see Appendix 3). If the Environmental Evaluation determines there would be environmental effects, the proposed plan would potentially generate significant public controversy, or special environmental concerns (e.g., wetlands, threatened or endangered species, etc.) are evident, then an EA is conducted under the provisions of NEPA (Peter Husby, NRCS, pers. comm.; see Appendix 3 for relevant forms).

## MONTANA FISH, WILDLIFE AND PARKS

The MFWP is a State agency and its actions must comply with MEPA. Any ground-disturbing actions, such as headgate construction, barrier removal, fish passage structure construction, etc., that MFWP would perform or contract under a site-specific plan developed under the Proposed Action would require preparation of an EA in accordance with section 12 of the Administrative Rules of Montana that describe MFWP's implementation of MEPA (see Appendix 4). Each EA would include a public comment period and result in a decision notice. An EA would be required were a specific plan to stock fluvial Arctic grayling eggs or fish in the Big Hole River proposed under the Agreement.

## MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

The MDNRC is a State agency and it must follow MEPA requirements when working on projects. The MDNRC would be involved primarily in monitoring streamflows and irrigation diversions and providing technical expertise on hydrology and State water law to the other agencies. The MDNRC's data collection activities do not require an environmental review under MEPA. Similar activities undertaken by MDNRC in other watersheds in Montana have not involved any formal environmental analysis under MEPA (Mike Roberts, MDNRC, pers. comm.).

## U.S. FISH AND WILDLIFE SERVICE

The USFWS is a Federal agency and actions must comply with NEPA. The USFWS Montana Partners program has been involved in ongoing fluvial Arctic grayling conservation efforts in the Big Hole River, and is expected to be USFWS' lead entity for implementation of the Proposed Action. The Partners program conducts an environmental evaluation for every conservation or restoration project with individual private landowners (see Appendix 6), and would follow an identical process under the Proposed Action. If this evaluation determines a significant environmental effect or identifies special environmental concerns, then an EA is conducted under the provisions of NEPA.

Site-specific compliance with laws and regulations protecting cultural and historic resources (e.g., NHPA and Montana SHPO) are generally accounted for in the above-described environmental analyses. Issues or concerns raised by the initial environmental analyses may lead to formal consultation with agency archeologists, historic preservation officers, and/or the Montana SHPO during the development of site-specific plans under the Proposed Action. The USFWS would review each proposed site-specific plan prior to issuing a CI under the Proposed Action's section 10 permit. In addition to evaluating each plan for consistency with the terms of the Agreement and the Permit, this review permits USFWS to verify that the agencies have met their environmental review obligations under applicable State and Federal laws.

## ENDANGERED SPECIES ACT

The potential issuance of a Permit that is associated with an Agreement is a Federal action that is subject to the consultation provisions of section 7 of the ESA. Section 7(a)(2) of the ESA requires all Federal agencies to ensure that "any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of designated critical habitat. The section 7 implementing regulations (50 CFR Part 402) require, among other things, analysis of the direct and indirect effects of a proposed action, the cumulative effects of other activities on listed species, and effects of the action on any designated critical habitat. Compliance with section 7 of the ESA is the Federal agency's responsibility, not the property owner's (i.e., not the applicant's). Therefore, USFWS must conduct an intra-USFWS (or internal) consultation or conference to ensure that issuance of the permit is not likely to jeopardize any listed species or destroy or adversely modify designated critical habitat. The USFWS also is required to complete a conference biological opinion on fluvial Arctic grayling to meet permit issuance criteria under the CCAA policy.

### **B. Environmental Justice**

Environmental justice is achieved when everyone, regardless of race, culture or income, enjoys the same degree of protection from environmental and health hazards and equal access to a healthy environment. None of the alternatives would have an impact upon women, minority groups, or civil rights of any citizen of the United States (Executive Order 12898). No Native American tribal resources would be negatively affected by the Agreement (Secretarial Order 3206).

### **C. Public Review and Comment**

The USFWS provided the Agreement and a draft EA to the public for review and comment for a period of 60 days, consistent with pertinent ESA and NEPA regulations and policy. The USFWS sent copies of the Agreement, and the draft EA directly to interested individuals including--Native American Tribes, private landowners, County Commissioners, congressional and State representatives, State and Federal agencies, and other potentially interested parties. Public comments on the draft EA were responded to in the Findings document that considers whether the USFWS should issue the enhancement of survival permit to MFWP. No changes were made the content of the EA between draft and final versions.

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## **VIII. LIST OF APPENDICES**

**Appendix 1.** Draft Candidate Conservation Agreement with Assurances for fluvial Arctic grayling in the upper Big Hole River.

**Appendix 2.** Montana Fish, Wildlife and Parks electrofishing and fish handling protocols.

**Appendix 3.** Environmental Evaluation instructions and worksheet (NRCS-CP-52) used by USDA Natural Resources Conservation Service.

**Appendix 4.** Administrative Rules of Montana for implementation of the Montana Environmental Protection Act by Montana Fish, Wildlife and Parks.

**Appendix 5.** Private Property Act assessment checklist for compliance with Chapter 462, Laws of Montana (1995).

**Appendix 6.** National Environmental Policy Act Federal activities checklist (Form 3-2185) used by the U.S. Fish and Wildlife Service.

**Appendix 1. Draft Candidate Conservation Agreement with Assurances for fluvial Arctic grayling in the upper Big Hole River**

**CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES FOR  
FLUVIAL ARCTIC GRAYLING IN THE UPPER BIG HOLE RIVER**

**Between**

**Montana Department of Fish, Wildlife and Parks**

**and**

**U.S. Fish and Wildlife Service**

**In cooperation with**

**Montana Department of Natural Resources and Conservation**

**and**

**USDA Natural Resources Conservation Service**

**FWS Tracking # TE104415-0**

**March 30, 2006**

## **Appendix 2. Montana Fish, Wildlife and Parks electrofishing and fish handling protocols**

## A. ELECTROFISHING METHODS POLICY

### INTRODUCTION

The growing interest in and use of Montana's fisheries resources by the public places ever increasing demands for obtaining information about our fish populations. Electrofishing has been a common fisheries sampling tool for over thirty years in Montana and it continues to be an important method for sampling fish populations today. Electrofishing is one of the few methods that allows fishery professionals to quantitatively sample fish populations for assessment of, among others, population dynamics, age and growth, and movement.

Over the years, injury to fish and other organisms as a result of electrofishing was known to occur but was generally considered to be of a minor and inconsequential nature. However, in 1988 a publication by Sharber and Carathers documented serious injury to large rainbow trout captured by electrofishing. The resulting publicity caused many agencies, including the Montana Department of Fish, Wildlife and Parks (MDFWP), to examine their own electrofishing practices.

Since 1989, MDFWP has tested a variety of electrofishing systems on a number of fish species (Fredenberg, W., 1992. *Evaluation of electrofishing-induced spinal injuries resulting from field electrofishing surveys in Montana*. Montana Department of Fish, Wildlife and Parks, Helena. Unpublished report. 43 p.) The study demonstrated a significant rate of injury to certain fish species with particular electrofishing gear. These results prompted a re-evaluation of previously accepted electrofishing practices and the development of guidelines for acceptable equipment type and use.

Electrofishing may result in adverse consequences for affected fish of a variety of species and life history stages. The presence of injuries under some circumstances dictates a conservative policy until more specific data are available. Injury should be assumed to occur unless information indicates otherwise. It is therefore the determination of the Fisheries Division that all electrofishing by any entity operating in the waters of the State of Montana conform to the following policy. Modification of this policy may be adopted as additional information becomes available.

### POLICY

It is the policy of the MDFWP that all electrofishing conducted in the waters of the State of Montana conform to the following standards to minimize injury to aquatic life. This policy shall apply to employees of MDFWP, other state and federal agencies and those entities operating under the authority of a collector's permit issued by MDFWP. The only exceptions to this policy are for permanent collections where all fish sampled are killed, or for experimental purposes. Exceptions must be approved by the Fisheries Division Administrator and such requests must be submitted with written justification at least sixty (60) days in advance. No other electrofishing may be conducted. Any violation of this policy will be referred to the Administrator of the Fisheries Division for corrective action.

### STANDARDS

1. Each electrofishing effort should be preceded by an analysis weighing anticipated negative impacts on aquatic life against benefits to be gained from the data collected. Other methods of data collection should be considered in this analysis.
2. Electrofishing over spawning areas containing eggs or larvae will be conducted only when eggs are needed for government hatcheries or the data to be collected are critical to the well being of the fish population as determined by the regional fisheries manager.

3. The use of electrofishing gear in waters containing Species of Special Concern should be minimized. Prior approval must be given by the regional fisheries manager before electrofishing in these waters.
4. Electrofishing in areas where threatened or endangered aquatic species may be encountered is restricted to situations in which electrofishing gear and methodology have been shown to be of minimal impact to that species or a recovery team has determined that electrofishing will be in the best interest of the threatened and endangered species. Authorization for "take" from the U.S. Fish and Wildlife Service must be obtained before electrofishing in waters that contain federally listed threatened or endangered species.
5. Electrofishing units which produce only 60 HZ pulsed DC waveforms are prohibited (e.g., Coffelt VVP2C, VVP2E, etc.). Settings on units that provide rectified sine, capacitor discharge or AC waveforms may not be used.
6. Settings on electrofishing units that produce pulse rates in excess of 30 HZ per second are not allowed in waters containing self-sustaining salmonid populations. The use of higher pulse rates for collection of warm/coolwater species should occur only after consideration has been given to the effect of this electrical form on these species and prior approval has been received by the regional fisheries manager.

#### PRACTICES

The following guideline table should be consulted before selecting and operating electrofishing equipment. The mention of specific brands and models of equipment is based solely on the electrical characteristics specified above. Other brands and models are excluded from this table due to lack of information. The MDFWP does not endorse any specific brand or model of electrofishing equipment.

Questions or comments on this policy should be directed to Fisheries Division, MFWP, PO Box 200701, Helena MT 59620-0701.

## MONTANA ELECTROFISHING GUIDELINES

<b>PARAMETER</b>	<b>RECOMMEND</b>	<b>AVOID</b>
<i>Pulse Rate</i>	30 Hz or less	Over 30 Hz
<i>Pulse Duration</i>	5 milliseconds	10 milliseconds or >
<i>Pulse Shape</i>	Smooth DC – Best  CPS – Second Choice  Square – Third Choice	Rectified Sine  Capacitor Discharge  AC
<i>Voltage</i>	High Conductivity= use low voltage  Low Conductivity = use high voltage	
<i>Shocker Box</i>	Coffelt Mark 22M  Coffelt Mark 22 CPS  Coffelt VVP 15 (smooth DC or low pulse rates)  Leach/Fisher (smooth DC only)	Coffelt VVP2C  Coffelt VVP2E  Leach/Fisher Pulse
<i>Generator</i>	Low Conductivity (<200 umhos/cm 2,500 W or >)  High Conductivity (>200 umhos/cm) 5,000 W or >)	Inadequate power supply/generator
<i>Electrode</i>	Bigger is Better – Always use largest possible anode except in highest conductivity water (800 umhos/cm or >)  Always maximize cathode size, in metal boats use the boat.	Small point anodes such as a single dropper.  Never use small cathode.
<i>Method</i>	Mobile Anode – Best	Never allow fish to lie in field
<i>Intensity</i>	Turn power down to the lowest effective level	Excessive current
<i>Brands</i>	Look for brands. If numerous, turn power down.	Branded fish are an indicator of spinal injury.



## MONTANA ELECTROFISHING GUIDELINES

PARAMETER	RECOMMEND	AVOID
<i>Fish Species</i>	<i>Most susceptible to spinal injury – Rainbow Trout Cutthroat Trout Brown Trout  Less Susceptible Arctic Grayling  Unknown Susceptibility Warmwater Spp.</i>	<i>Never assume fish are not being injured based only on external appearance.</i>
<i>Fish Size</i>	<i>Exercise caution with large fish.</i>	<i>Do not assume small fish are immune to spinal injury.</i>
<i>Environmental Variables</i>	<i>Record water temperature and conductivity and adjust methods accordingly.</i>	<i>Do not ignore water conditions.</i>
<i>Eggs</i>	<i>Assume eggs in redds have potential to be damaged.</i>	<i>Avoid shocking spawning females and areas with redds.</i>
<i>Crew</i>	<i>Use trained crews.</i>	<i>Avoid multiple-dipping into the field and other factors that will stress fish.</i>

### B. ELECTROFISHING SAFETY POLICY & GUIDELINES

All electrofishing operations will be conducted in accordance with Montana Department of Fish, Wildlife and Parks electrofishing guidelines, using only trained electrofishing crew members. All equipment must be constructed and operated according to approved electrofishing guidelines.

#### General Electrofishing Guidelines

Electrofishing guidelines are set up to provide the groundwork for electrofishing crews to safely and efficiently perform their work duties. There are several factors affecting a safe, efficient electrofishing operation; primary among these are experienced personnel, safe equipment, and updated training.

- I. Experienced Personnel – All electrofishing crews must be led by a crew leader who has taken a Fish, Wildlife and Parks safety standards course.
  - a. Crew leader – Must receive formal training in water safety, electrofishing theory and electrical safety.
  - b. Crew member – Must receive some form of water safety instruction and be instructed by the crew leader in current electrofishing safety techniques for expected electrofishing type and water conditions.

- II. Safe Equipment – Electrofishing equipment must be maintained in good working order. It must be constructed and operated according to Fish, Wildlife and Parks safety standards. The crew must be trained in its safe operation and maintenance.
- III. Guidelines for Specific Electrofishing Operations – Each type of electrofishing has its own specific operational and safety procedures, which the crew leader is responsible for implementing.
- IV. Continued Safety Training – Safety training of all electrofishing crews will be updated with new equipment and safety procedures as they become available.

### **Specific Electrofishing Guidelines**

#### **I. Experienced Personnel**

- A. All fisheries personnel that use electrofishing equipment as a management tool will be familiar with equipment and its safe operation.
- B. At least one member of each electrofishing crew (crew leader) will have taken the Montana Department of Fish, Wildlife and Parks electrofishing safety course. All other crew members must take a standard one day electrofishing safety and training course taught by a trained crew leader which will include equipment and safety checklists and a "dry run" with no electricity in the water.
- C. All electrofishing crew members must be able to swim 25 yards with a personal flotation device (life jacket) and waders on.
- D. At least two members of every electrofishing crew must have current certification in CPR (Cardio-Pulmonary Resuscitation).
- E. All crew members must be physically fit and must report known health problems to their supervisor.

#### **II. Safe Equipment**

##### **A. Personal Equipment**

- 1. All personnel on the electrofishing crew must be equipped with waterproof footwear that is free of leaks. Belted chest-high waders or neoprene waders with slip-resistant soles are generally recommended for most electrofishing to provide adequate boot height to prevent body contact with the water. Neoprene waders are available for cold weather electrofishing.
- 2. All personnel on the electrofishing crew must wear waterproof rubberized gloves that are free of leaks.
- 3. The wearing of polarized sunglasses is recommended to increase in-water visibility (safety) and the effective retrieval of fish.
- 4. At the crew leader's discretion (with the exception of boom shocking on large rivers or in lakes), crew members will wear a personal flotation device.
- 5. All electrofishing boats must carry a first aid kit. Spare clothing and fire-starter supplies, packed in a waterproof storage bag, are also recommended.

##### **B. General operational safety procedures**

1. The anode should never touch the cathode or any other metal equipment.
2. All equipment will be given a thorough inspection before use.
3. Electrofishing will not be conducted if climatic or water conditions are such as to pose safety problems beyond those normally expected.
4. If any person feels an electric shock, even minor, the electrofishing operation must be shut down and repaired. A report on the incident must be given to the regional fisheries manager or your immediate supervisor.
5. "Dip" net handles that have metal cores will be covered with a non-conductive material and then frequently inspected for cracks. Rubber butt-caps must be in place.

### III. Guidelines for Various Types of Electrofishing

- A. Large River Fixed-Electrode (boom) Electrofishing; generally jet-boat propulsion but may also be rowed.
  1. A minimum crew of two personnel, of which at least one must be a trained crew leader.
  2. Only crew members experienced in motorized river boat operation may drive the electrofishing boat. Untrained boat operators may drive the boat only under the direct supervision of the trained personnel by their side.
  3. The electrofishing boat can be constructed of either metal or nonmetal, and when it is of metal construction, the hull of the boat should be used as a cathode.
    - a. All internal metal equipment must be grounded to the boat.
    - b. Skid-proof decking is required on the netting platform.
  4. There should be a guard rail 36-48 inches above the netting platform to protect "dip" netters from falling out of the boat during electrofishing operation.
  5. "Positive" kill switches for the electrofishing circuit must be installed, with one switch in easy reach of boat operator and one for the dip netter(s). It is recommended that a "positive" kill be installed for the boat operator that will also shut off the generator.
  6. Crew leader should have a good knowledge of the water hazards present in each of his electrofishing sections. All new sections must be "run" in the boat prior to electrofishing.
  7. A functional fire extinguisher must be carried in a readily-accessible location in the boat.
  8. A first-aid kit must be carried in the boat.
  9. Crew members must wear some form of personal flotation device at all times.
  10. An extra change of clothing and dry matches are recommended for crew members, if space is available.
  11. Wearing of hearing protection devices is optional but recommended.
  12. Night electrofishing
    - a. Primary lighting must be a 12-volt system to avoid blackouts if the generator malfunctions. A 110- or 220-volt lighting system is recommended as a secondary or accessory system.

- b. The electrofishing boat must carry a fully charged spare 12-volt battery and a flashlight.
- c. The boat must be equipped with a 12-volt spotlight hand-held by the driver and used to navigate boating hazards. The 12-volt system must be semi-permanently grounded to prevent possible blackouts from circuit disruption (not alligator clips).
- d. All lighting should be equipped with in-line switches rather than using a battery terminal disconnect.
- e. Night electrofishing will be conducted only after the reach or body of water has been thoroughly scouted and preferably electrofished during daylight hours first.
- f. Electrofishing boats should be equipped with internal lighting sufficient to light the deck and the area behind the deck around the fish holding tank.
- g. On large or remote lakes or streams it may be advisable to carry an extra motor. At a bare minimum, night shocking crews should have sufficient gear to spend the night out if a breakdown occurs.

13. Electrofishing observers

Untrained observers will be allowed as a secondary dipnetter only after a thorough briefing on the safety aspects of the operation, and only when accompanied on the netting platform by a trained crew member (primary dipnetter).

B. Drift Mobile or Boom Electrofishing (no motor)

This refers to an electrofishing operation where two people remain in the boat and one person in the water controls the boat, generally small or medium-sized rivers.

- 1. A minimum crew of two personnel of which one must be a trained crew leader, with only experienced personnel handling the boat.
- 2. Electrofishing boat must be constructed of a non-conductive material with all internal metal equipment having a common ground, but not grounded to the external cathode.
  - a. Skid-proof decking is required on the netting platform.
  - b. Only plastic gas containers may be used.
- 3. There must be a 36-48 inch guardrail to protect netters from falling out of the boat during the electrofishing operation.
- 4. Mobile anode handles must be made of a non-conductive material and electric cord frequently inspected for weak spots.
- 5. "Positive" kill switches must be installed in the electrofishing circuit, with one located near boat operator and one near "dip" netters and anode operator. It is recommended that the rear kill switch also be installed so that it will kill the generator.
- 6. Crew leader should have a good knowledge of water hazards present in each shocking section.
- 7. Wearing of hearing protection is optional, but is recommended.
- 8. A functional fire extinguisher must be carried in the boat, mounted in a readily accessible location.
- 9. Crew members must wear some form of personal flotation device unless the crew leader designates it optional on a particular water.

10. It is recommended that crew members should have an extra change of clothes and dry matches, if space in the boat is available, especially during cold weather shocking.
11. No observers will be allowed in the electrofishing boat. They must either observe from the bank or from another boat.

C. Portable Drift Electrofishing

This type of electrofishing is a hybrid of drift and bank shocking where a boat is used to carry the generator and other shocking equipment, but electrofishing personnel do not normally ride in the boat (Crawdadd shocking).

1. A minimum crew of three personnel of which one must be a trained crew leader, with only experienced personnel handling the boat and shocker unit.
2. The electrofishing boat must be constructed of a non-conductive material with all internal metal having a common ground, but not grounded to the external cathode. Only plastic gas cans can be carried in the boat.
3. Mobile anode handles must be made of a non-conductive material and electric cord frequently inspected for weak spots.
4. "Positive" kill switches must be installed in the electrofishing circuit, with one located near the boat operator.
5. Crew leader should have a good knowledge of water hazards present in each shocking section.
6. Wearing of hearing protection is optional.
7. A fire extinguisher must be carried in the boat.
8. Crew members must wear some form of personal flotation device unless the crew leader designates it optional on a particular water.
9. It is advisable that crew members have an extra change of clothing and dry matches.
10. No observers will be allowed in the immediate vicinity of the electrofishing operation.
11. In deep water the anode operator may sit (not stand) on the foredeck of the boat. The dipnetter may not ride in the boat under any circumstances while the electrofishing operation is under way.

D. Backpack Electrofishing

1. A minimum crew of two personnel of which one member must be a trained crew leader.
2. The backpack unit must be equipped with a quick release belt.
3. When battery-powered units are used, a gel-cell leak-proof battery should be used to minimize acid burn possibilities.
4. An "excessive tilt" electrical shutoff for electric current will be installed on the backpack unit.
5. Mobile anode must contain a "deadman" type switch in the handle to break the electrical current. The handle must be constructed on a non-conductive material. Taping down the deadman switch is a serious safety hazard, and is prohibited.
6. Observers may be used in this type of electrofishing operation, but only as a secondary dipnetter or to transport fish up or downstream to "livecars".

E. Bank Electrofishing

This refers to the method of placing a generator on the bank and running a cord upstream or downstream. Due to the safety implications this method should be avoided unless absolutely necessary.

1. A minimum crew of two personnel of which one member must be a trained crew leader.
2. The bank electrofishing unit (generator and electrofishing box) must have a common ground to earth to reduce shock hazard.
3. The bank electrofisher must have a "positive" kill switch for both the electrode operator and the dip netter. These positive kill switches must be either made waterproof or operate off of a 12 volt safety circuit.
4. Observers must remain on the stream bank and not enter the stream during the electrofishing operation.



# **Montana Fish, Wildlife & Parks**

## **Fisheries Division Gill Netting Guidelines 2002**

Gill nets are a standard management tool, widely used within the Fisheries Division. They are also potentially lethal to personnel who utilize them. The following suggestions on conditions for use of gill nets have been developed by the Electrofishing/Water Safety Committee to provide guidance for safe working conditions for those new to gill net use, and as a reminder for more experienced personnel.

1. Never, ever, work alone! Gill nets have a deadly affinity for zippers, pull tabs, buttons, rings, and fingers. Entanglement in a net can be impossible to escape without assistance. Do not set or pull gill nets by yourself.
2. Dress for success. Minimize exposed clothing with buttons, zippers, etc. that are prone to tangling. Some raincoats, hooded sweatshirts, etc. are well-adapted to this operation. Remove rings, watches, nose rings, or earrings, before handling nets.
3. Life Preservers. Wear them always, preferably under smooth external clothing.
4. Boats. Use enough boat for the water you are on! Float tubes, inflatable vinyl rafts, etc. will not do the job. The boat must be sufficient to handle the worst-case scenario, which includes hung up nets or bad weather. Use great care with motors. An entangled motor will stall, causing the boat to turn stern toward the waves and swamp in rough water.
5. Weather. Check the forecast! A boat suitable for setting nets in light water may be totally unsafe for rough water retrieval. If the nets cannot be safely pulled, let them fish until the weather improves. Better the fish die than you.
6. Net Loss. No one wants a lost net. They fish for a long time. Use adequate anchors and strong buoy lines. Be sure that both ends are marked with brightly-colored buoys and identified with DFWP lettering. Floating nets should be marked in several places along their length.
7. Helicopter Netting. This is an irreplaceable but inherently dangerous technique for sampling mountain lakes. Always wear a life preserver. A lifeline may be useful. Never throw anything; the rotors are unforgiving. The pilot cannot help you so be extremely cautious.
8. Non-target Catches. Make maximum use of buoys to warn away swimmers, divers, and boaters. Talk to people on the lake and tell them nets are out. The potential for fatalities is real. Avoidance of areas and times of heavy public use helps reduce risk. There are major legal and emotional consequences to an accident. Don't be the first!

**Appendix 3. Environmental Evaluation instructions and worksheet (NRCS-CP-52) used  
by USDA Natural Resources Conservation Service**



## Instructions for Completing Form NRCS-CPA-52, "Environmental Evaluation Worksheet"

**COMPLETING THE FORM:** The form NRCS-CPA-52 is the instrument used to summarize the effects of conservation practices and systems. It also provides summary documentation of the environmental evaluation (EE) of the planned actions. The EE is "a concurrent part of the planning process in which the potential long-term and short-term impacts of an action on people, their physical surroundings, and nature are evaluated and alternative actions explored" (NPPH-Amendment 3 January 2000). The EE applies to all assistance provided by NRCS (GM190 Part 410.5).

The following are instructions for completing form NRCS-CPA-52:

- A Record the client's name.
- B Enter the conservation plan identification number.
- C Enter the conservation management unit to which this evaluation applies. This may be done by field, pasture, tract, landuse (i.e., cropland, rangeland, woodland, etc.), by resource area (i.e., riparian corridor or wetland area), or any other suitable geographic division.
- D Briefly summarize the client's objective(s).
- E Briefly identify the purpose and need for action. Reference the resource concern(s) to be addressed.
- F, Use the provided resource, economic, and social considerations or list considerations identified during scoping or by
- G any existing area wide, watershed or other resource document appropriate for the planning area. The list of considerations may be expanded by listing subcategories, such as wind erosion, sheet erosion, gully erosion, etc. Refer to the applicable quality criteria.
- H, Briefly summarize the practice/system of practices being proposed, as well as any alternatives being considered
- I Document the effects of the proposed action for the considerations listed in Sections E and F. Reference applicable quality criteria, information in the CPPE, and quantify effects whenever possible. Consider both long-term and short-term effects. Consider any effects, which may be individually minor but cumulatively significant at a larger scale or over an extended time period. At the request of the client, additional alternatives may be developed and their effects evaluated. This may be done in order to more fully inform the client about the decision to be made. In these cases, briefly describe alternatives to the proposed action, including the "no action" alternative. The no action alternative is the predicted future condition if no action is taken. Clearly define the differences between proposed action, no action, and the other alternatives if applicable.
- J, See the Special Environmental Concerns Evaluation Procedure Guide Sheets in Appendix 610.70 of the National
- K the National Environmental Compliance Handbook. Completion of Help Sheets is not required, but may provide additional documentation that the appropriate processes have been followed. Complete Section J by documenting the effects of each alternative on the special environmental concerns listed in Section I. Quantify effects whenever possible. Consider both long-term and short-term effects. Consider any effects, which may be individually minor but cumulatively significant at a larger scale or over an extended time period.
- L List any necessary easements, permissions, or permits (i.e., 404, ESA Section 10, state, county, or tribal permits or requirements).
- M Describe mitigation to be applied that will offset any adverse impacts. Attach documentation from other agencies.
- N The individual responsible for completing the CPA-52 must sign and date the form indicating they have used the best available information. This signature is particularly important when a TSP is completing the CPA-52 or when NRCS is providing technical assistance on behalf of another agency.
- O Document contact and communications with USFWS, NOAA Fisheries, COE, EPA, NRCS state biologist, state environmental agencies, or any others consulted. Include public participation activities, if applicable.
- P Check the applicable finding being made.
- Q Explain the reasons for making the finding identified in Section P. Cite any references, analysis, data, or documents, which support the finding. Add additional pages as necessary. To find that an action has been sufficiently analyzed in an existing NRCS environmental document, the document must cover the area in which the action is being implemented.
- R NRCS responsible official must sign and date for NRCS actions. The FSA or other federal agency responsible official must sign and date for FSA or other agency funded activities.

**CRITERIA FOR IDENTIFYING EXTRAORDINARY CIRCUMSTANCES.** Extraordinary circumstances usually involve impacts on environmental concerns such as wetlands, floodplains, or cultural resources. The circumstances that may lead to a determination of extraordinary circumstances are the same factors used to make determinations of significance and include:

1. Impacts that may be both beneficial and adverse and that significantly affect the quality of the human environment.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the area, such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be controversial.
5. The degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.
7. Individually insignificant but cumulatively significant activities that have not been analyzed on a broader level, such as on a program-wide or priority area basis.
8. Adverse effects on areas listed in or eligible for listing in the National Register of Historic Places, or that may result in loss or destruction of significant scientific, cultural, or historical resources.
9. Adverse effects on an endangered or threatened species or its designated critical habitat.
10. Circumstances threatening the violation of federal, state, tribal, or local law or requirements imposed for the protection of the environment.

If one or more extraordinary circumstances are found to apply to the proposed action, determine whether the proposal can be modified to mitigate the adverse effects and prevent the extraordinary circumstances. If this can be done and the client agrees to the change, then the proposed action may be modified and categorically excluded. If the proposed action cannot be modified or the client refuses to accept a proposed change, prepare an EA or EIS as indicated above.

If none of the extraordinary circumstances are determined to apply to the proposed action (or modified action), then it may be categorically excluded. Document the rationale for the determination in Section Q.

## Environmental Evaluation Worksheet

A. Client:

B. Plan ID No:

C. CMU/Fields:

D. Client's Objective

E. Purpose and Need for Action

F. Resource  
Considerations

H. Alternatives and Effects (ATTACH ADDITIONAL PAGES AS NECESSARY)

Proposed Action

No Action

Alt 1

Alt 2

### SOIL

Erosion

Condition

Deposition

### WATER

Quantity

Quality

### AIR

Quality

Condition

### PLANT

Suitability

Condition

Management

### ANIMAL

Habitat

Management

G. Economic and Social  
Considerations

I. Effects

Proposed Action

No Action

Alt 1

Alt 2

Land use

Capital

Labor

Management level

Profitability

Risk

J. Special Environmental Concerns (See "Evaluation Procedure Guide Sheets") Section 610.71 of National Environmental Compliance Handbook	K. Effects			
	Proposed Action	No Action	Alt 1	Alt 2
Clean Water Act/Waters of the U.S				
*Coastal Zone Management Areas				
Coral Reefs				
*Cultural Resources				
*Endangered and Threatened Species				
Environmental Justice				
*Essential Fish Habitat				
*Fish and Wildlife Coordination				
Floodplain Management				
Invasive Species				
Migratory Birds				
Natural Areas				
Prime and Unique Farmlands				
Riparian Area				
Scenic Beauty				
Wetlands				
*Wild and Scenic Rivers				

\* These items may require consultation or coordination between the lead agency/RFO and another governmental unit.

L. Easements, permissions, or permits \_\_\_\_\_

M. Mitigation \_\_\_\_\_

N. The information recorded above is based on the best available information:

Signature \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

O. Agencies, persons, and references consulted \_\_\_\_\_

**P. Findings.** Indicate which of the alternatives from Section H is the preferred alternative. \_\_\_\_\_

I have considered the effects of this action and the alternatives on the Resource, Economic, and Social Considerations; the Special Environmental Concerns; and the extraordinary circumstances criteria in the instructions for form NRCS-CPA-52. I find, for the reasons stated in Section Q below, that the selected alternative:

\_\_\_\_\_ is not a federal action. No additional analysis is required.

\_\_\_\_\_ is categorically excluded from further environmental analysis and there are no extraordinary circumstances. No additional analysis is required.

\_\_\_\_\_ has been sufficiently analyzed in an existing NRCS environmental document. No additional analysis is required.

\_\_\_\_\_ may require preparation of an EA or EIS. The action will be referred to the state office.

**Q. Rationale supporting the finding**

R. \_\_\_\_\_  
District Conservationist Signature \_\_\_\_\_ Date \_\_\_\_\_



**Appendix 4. Administrative Rules of Montana (ARM) for implementation of the  
Montana Environmental Protection Act (MEPA) by Montana Fish, Wildlife and Parks**

## ADMINISTRATIVE RULES OF MONTANA

\*\*\* THIS DOCUMENT IS CURRENT THROUGH MARCH 31, 2005 \*\*\*

TITLE 12: DEPARTMENT OF FISH, WILDLIFE AND PARKS  
CHAPTER 2: OVERALL DEPARTMENT RULES  
SUB-CHAPTER 4: RULES IMPLEMENTING THE MONTANA ENVIRONMENTAL POLICY ACT

## 12.2.428 POLICY STATEMENT CONCERNING MEPA RULES

The purpose of these rules is to implement Title 75, chapter 1, MCA, the Montana Environmental Policy Act (MEPA), through the establishment of administrative procedures. MEPA requires that state agencies comply with its terms "to the fullest extent possible." In order to fulfill the stated policy of that act, the agency shall conform to the following rules prior to reaching a final decision on proposed actions covered by MEPA.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

## 12.2.429 DEFINITIONS

1) "Action" means a project, program or activity directly undertaken by the agency; a project or activity supported through a contract, grant, subsidy, loan or other form of funding assistance from the agency, either singly or in combination with one or more other state agencies; or a project or activity involving the issuance of a lease, permit, license, certificate, or other entitlement for use or permission to act by the agency, either singly or in combination with other state agencies.

(2)(a) "Alternative" means:

(i) an alternate approach or course of action that would appreciably accomplish the same objectives or results as the proposed action;

(ii) design parameters, mitigation, or controls other than those incorporated into a proposed action by an applicant or by an agency prior to preparation of an EA or draft EIS;

(iii) no action or denial; and

(iv) for agency-initiated actions, a different program or series of activities that would accomplish other objectives or a different use of resources than the proposed program or series of activities.

(b) The agency is required to consider only alternatives that are realistic, technologically available, and that represent a course of action that bears a logical relationship to the proposal being evaluated.

(3) "The agency" means the Montana department of fish, wildlife, and parks.

(4) "Applicant" means a person or any other entity who applies to the agency for a grant, loan, subsidy, or other funding assistance, or for a lease, permit, license, certificate, or other entitlement for use or permission to act.

(5) "Categorical exclusion" refers to a type of action which does not individually, collectively, or cumulatively require an EA or EIS, as determined by rulemaking or programmatic review adopted by the agency, unless extraordinary circumstances, as defined by rulemaking or programmatic review, occur.

(6) "Compensation" means the replacement or provision of substitute resources or environments to offset an impact on the quality of the human environment. The agency may not consider compensation for purposes of determining the significance of impacts (see ARM 12.2.430(4)).

(7) "Cumulative impact" means the collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures.

(8) "Emergency actions" include, but are not limited to:

## MONT. ADMIN. R. 12.2.430

(a) projects undertaken, carried out, or approved by the agency to repair or restore property or facilities damaged or destroyed as a result of a disaster when a disaster has been declared by the governor or other appropriate government entity;

(b) emergency repairs to public service facilities necessary to maintain service; and

(c) projects, whether public or private, undertaken to prevent or mitigate immediate threats to public health, safety, welfare, or the environment.

(9) "Environmental assessment" (EA) means a written analysis of a proposed action to determine whether an EIS is required or to serve one or more of the other purposes described in ARM 12.2.430(2).

(10) "Environmental impact statement" (EIS) means the detailed written statement required by section 75-1-201, MCA, which may take several forms:

(a) "Draft environmental impact statement" means a detailed written statement prepared to the fullest extent possible in accordance with 75-1-201(1)(b)(iii), MCA, and these rules;

(b) "Final environmental impact statement" means a written statement prepared to the fullest extent possible in accordance with 75-1-201, MCA, and ARM 12.2.437 or 12.2.438 and which responds to substantive comments received on the draft environmental impact statement;

(c) "Joint environmental impact statement" means an EIS prepared jointly by more than one agency, either state or federal, when the agencies are involved in the same or a closely related proposed action.

(11) "Environmental quality council" (EQC) means the council established pursuant to Title 75, chapter 1, MCA, and 5-16-101, MCA.

(12) "Human environment" includes, but is not limited to biological, physical, social, economic, cultural, and aesthetic factors that interrelate to form the environment. As the term applies to the agency's determination of whether an EIS is necessary (see ARM 12.2.430(1)), economic and social impacts do not by themselves require an EIS. However, whenever an EIS is prepared, economic and social impacts and their relationship to biological, physical, cultural and aesthetic impacts must be discussed.

(13) "Lead agency" means the state agency that has primary authority for committing the government to a course of action or the agency designated by the governor to supervise the preparation of a joint environmental impact statement or environmental assessment.

(14) "Mitigation" means:

(a) avoiding an impact by not taking a certain action or parts of an action;

(b) minimizing impacts by limiting the degree or magnitude of an action and its implementation;

(c) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; or

(d) reducing or eliminating an impact over time by preservation and maintenance operations during the life of an action or the time period thereafter that an impact continues.

(15) "Programmatic review" means an analysis (EIS or EA) of the impacts on the quality of the human environment of related actions, programs, or policies.

(16) "Residual impact" means an impact that is not eliminated by mitigation.

(17) "Scope" means the range of reasonable alternatives, mitigation, issues, and potential impacts to be considered in an environmental assessment or an environmental impact statement.

(18) "Secondary impact" means a further impact to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action.

(19) "State agency", means an office, commission, committee, board, department, council, division, bureau, or section of the executive branch of state government.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)



### 12.2.430 GENERAL REQUIREMENTS OF THE ENVIRONMENTAL REVIEW PROCESS

Section 75-1-201, MCA, requires state agencies to integrate use of the natural and social sciences and the environmental design arts in planning and in decision-making, and to prepare a detailed statement (an EIS) on each proposal for projects, programs, legislation, and other major actions of state government significantly affecting the quality of the human environment. In order to determine the level of environmental review for each proposed action that is necessary to comply with 75-1-201, MCA, the agency shall apply the following criteria:

(1) The agency shall prepare an EIS as follows:

(a) whenever an EA indicates that an EIS is necessary; or

(b) whenever, based on the criteria in ARM 12.2.431, the proposed action is a major action of state government significantly affecting the quality of the human environment.

(2) An EA may serve any of the following purposes:

(a) to ensure that the agency uses the natural and social sciences and the environmental design arts in planning and decision-making. An EA may be used independently or in conjunction with other agency planning and decision-making procedures;

(b) to assist in the evaluation of reasonable alternatives and the development of conditions, stipulations or modifications to be made a part of a proposed action;

(c) to determine the need to prepare an EIS through an initial evaluation and determination of the significance of impacts associated with a proposed action;

(d) to ensure the fullest appropriate opportunity for public review and comment on proposed actions, including alternatives and planned mitigation, where the residual impacts do not warrant the preparation of an EIS; and

(e) to examine and document the effects of a proposed action on the quality of the human environment, and to provide the basis for public review and comment, whenever statutory requirements do not allow sufficient time for an agency to prepare an EIS. The agency shall determine whether sufficient time is available to prepare an EIS by comparing statutory requirements that establish when the agency must make its decision on the proposed action with the time required by ARM 12.2.439 to obtain public review of an EIS plus a reasonable period to prepare a draft EIS and, if required, a final EIS.

(3) The agency shall prepare an EA whenever:

(a) the action is not excluded under (5) and it is not clear without preparation of an EA whether the proposed action is a major one significantly affecting the quality of the human environment;

(b) the action is not excluded under (5) and although an EIS is not warranted, the agency has not otherwise implemented the interdisciplinary analysis and public review purposes listed in (2) (a) and (d) through a similar planning and decision-making process; or

(c) statutory requirements do not allow sufficient time for the agency to prepare an EIS.

(4) The agency may, as an alternative to preparing an EIS, prepare an EA whenever the action is one that might normally require an EIS, but effects which might otherwise be deemed significant appear to be mitigable below the level of significance through design, or enforceable controls or stipulations or both imposed by the agency or other government agencies. For an EA to suffice in this instance, the agency must determine that all of the impacts of the proposed action have been accurately identified, that they will be mitigated below the level of significance, and that no significant impact is likely to occur. The agency may not consider compensation for purposes of determining that impacts have been mitigated below the level of significance.

(5) The agency is not required to prepare an EA or an EIS for the following categories of action:

(a) actions that qualify for a categorical exclusion as defined by rule or justified by a programmatic review. In the rule or programmatic review, the agency shall identify any extraordinary circumstances in which a normally excluded action an EA or EIS;

## MONT. ADMIN. R. 12.2.431

- (b) administrative actions: routine, clerical or similar functions of a department, including but not limited to administrative procurement, contracts for consulting services, and personnel actions;
- (c) minor repairs, operations, or maintenance of existing equipment or facilities;
- (d) investigation and enforcement: data collection, inspection of facilities or enforcement of environmental standards;
- (e) ministerial actions: actions in which the agency exercises no discretion, but rather acts upon a given state of facts in a prescribed manner; and
- (f) actions that are primarily social or economic in nature and that do not otherwise affect the human environment.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.431 DETERMINING THE SIGNIFICANCE OF IMPACTS 1) In order to implement 75-1-201, MCA, the agency shall determine the significance of impacts associated with a proposed action. This determination is the basis of the agency's decision concerning the need to prepare an EIS and also refers to the agency's evaluation of individual and cumulative impacts in either EAs or EISs. The agency shall consider the following criteria in determining the significance of each impact on the quality of the human environment:

- (a) the severity, duration, geographic extent, and frequency of occurrence of the impact;
- (b) the probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;
- (c) growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts;
- (d) the quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources or values;
- (e) the importance to the state and to society of each environmental resource or value that would be affected;
- (f) any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and
- (g) potential conflict with local, state, or federal laws, requirements, or formal plans.

(2) An impact may be adverse, beneficial, or both. If none of the adverse effects of the impact are significant, an EIS is not required. An EIS is required if an impact has a significant adverse effect, even if the agency believes that the effect on balance will be beneficial.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.432 PREPARATION AND CONTENTS OF ENVIRONMENTAL ASSESSMENTS 1) The agency shall prepare an EA, regardless of its length or the depth of analysis, in a manner which utilizes an interdisciplinary approach. The agency may initiate a process to determine the scope of issues to be addressed in an EA. Whenever the agency elects to initiate this process, it shall follow the procedures contained in ARM 12.2.434.

(2) For a routine action with limited environmental impact, the contents of an EA may be reflected on a standard checklist format. At the other extreme, whenever an action is one that might normally require an EIS, but effects that otherwise might be deemed significant are mitigated in project design or by controls imposed by the agency, the analysis, format, and content must all be more substantial. The agency shall prepare the evaluations and present the information described in section (3) as applicable and in a level of detail appropriate to the following considerations:

- (a) the complexity of the proposed action;
- (b) the environmental sensitivity of the area affected by the proposed action;
- (c) the degree of uncertainty that the proposed action will have a significant impact on the quality of the human environment;

## MONT. ADMIN. R. 12.2.435

- (d) the need for and complexity of mitigation required to avoid the presence of significant impacts.
- (3) To the degree required in (2) above, an EA must include:
  - (a) a description of the proposed action, including maps and graphs;
  - (b) a description of the benefits and purpose of the proposed action. If the agency prepares a cost/benefit analysis before completion of the EA, the EA must contain the cost/benefit analysis or a reference to it;
  - (c) a listing of any state, local, or federal agencies that have overlapping or additional jurisdiction or environmental review responsibility for the proposed action and the permits, licenses, and other authorizations required;
  - (d) an evaluation of the impacts, including cumulative and secondary impacts, on the physical environment. This evaluation may take the form of an environmental checklist and/or, as appropriate, a narrative containing more detailed analysis of topics and impacts that are potentially significant, including, where appropriate: terrestrial and aquatic life and habitats; water quality, quantity, and distribution; geology; soil quality, stability, and moisture; vegetation cover, quantity and quality; aesthetics; air quality; unique, endangered, fragile, or limited environmental resources; historical and archaeological sites; and demands on environmental resources of land, water, air and energy;
  - (e) an evaluation of the impacts, including cumulative and secondary impacts, on the human population in the area to be affected by the proposed action. This evaluation may take the form of an environmental checklist and/or, as appropriate, a narrative containing more detailed analysis of topics and impacts that are potentially significant, including where appropriate, social structures and mores; cultural uniqueness and diversity; access to and quality of recreational and wilderness activities; local and state tax base and tax revenues; agricultural or industrial production; human health; quantity and distribution of employment; distribution and density of population and housing; demands for government services; industrial and commercial activity; locally adopted environmental plans and goals; and other appropriate social and economic circumstances;
  - (f) a description and analysis of reasonable alternatives to a proposed action whenever alternatives are reasonably available and prudent to consider and a discussion of how the alternative would be implemented;
  - (g) a listing and appropriate evaluation of mitigation, stipulations, and other controls enforceable by the agency or another government agency;
  - (h) a listing of other agencies or groups that have been contacted or have contributed information;
  - (i) the names of persons responsible for preparation of the EA; and
  - (j) a finding on the need for an EIS and, if appropriate, an explanation of the reasons for preparing the EA. If an EIS is not required, the EA must describe the reasons the EA is an appropriate level of analysis.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.433 PUBLIC REVIEW OF ENVIRONMENTAL ASSESSMENTS 1) The level of analysis in an EA will vary with the complexity and seriousness of environmental issues associated with a proposed action. The level of public interest will also vary. The agency is responsible for adjusting public review to match these factors.

(2) An EA is a public document and may be inspected upon request. Any person may obtain a copy of an EA by making a request to the agency. If the document is out-of-print, a copying charge may be levied.

(3) The agency is responsible for providing additional opportunities for public review consistent with the seriousness and complexity of the environmental issues associated with a proposed action and the level of public interest. Methods of accomplishing public review include publishing a news release or legal notice to announce the availability of an EA, summarizing its content and soliciting public comment; holding public meetings or hearings; maintaining mailing lists of persons interested in a particular action or type of action and notifying them of the availability of EAs on such actions; and distributing copies of EAs for review and comment.

(4) For an action with limited environmental impact and little public interest, no further public review may be warranted. However, where an action is one that normally requires an EIS, but effects that otherwise might be deemed significant are mitigated in the project proposal or by controls imposed by the agency, public involvement must include the opportunity for public comment, a public meeting or hearing, and adequate notice. The agency is responsible for determining appropriate methods to ensure adequate public review on a case by case basis.

## MONT. ADMIN. R. 12.2.435

(5) The agency shall maintain a log of all EAs completed by the agency and shall submit a list of any new EAs completed to the office of the governor and the environmental quality council on a quarterly basis. In addition, the agency shall submit a copy of each completed EA to the EQC.

(6) The agency shall consider the substantive comments received in response to an EA and proceed in accordance with one of the following steps, as appropriate:

- (a) determine that an EIS is necessary;
- (b) determine that the EA did not adequately reflect the issues raised by the proposed action and issue a revised document; or
- (c) determine that an EIS is not necessary and make a final decision on the proposed action, with appropriate modification resulting from the analysis in the EA and analysis of public comment.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.434 DETERMINING THE SCOPE OF AN EIS 1) Prior to the preparation of an EIS, the agency shall initiate a process to determine the scope of the EIS.

(2) To identify the scope of an EIS, the agency shall:

- (a) invite the participation of affected federal, state, and local government agencies, Indian tribes, the applicant, if any, and interested persons or groups;
- (b) identify the issues related to the proposed action that are likely to involve significant impacts and that will be analyzed in depth in the EIS;
- (c) identify the issues that are not likely to involve significant impacts, thereby indicating that unless unanticipated effects are discovered during the preparation of the EIS, the discussion of these issues in the EIS will be limited to a brief presentation of the reasons they will not significantly affect the quality of the human environment; and
- (d) identify those issues that have been adequately addressed by prior environmental review, thereby indicating that the discussion of these issues in the EIS will be limited to a summary and reference to their coverage elsewhere; and
- (e) identify possible alternatives to be considered.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

## 12.2.435 ENVIRONMENTAL IMPACT STATEMENTS--GENERAL REQUIREMENTS

The following apply to the design and preparation of EISs:

- (1) The agency shall prepare EISs that are analytic rather than encyclopedic.
- (2) The agency shall discuss the impacts of a proposed action in a level of detail that is proportionate to their significance. For other than significant issues, an EIS need only include enough discussion to show why more study is not warranted.
- (3) The agency shall prepare with each draft and final EIS a brief summary that is available for distribution separate from the EIS. The summary must describe:
  - (a) the proposed action being evaluated by the EIS, the impacts, and the alternatives;
  - (b) areas of controversy and major conclusions;
  - (c) the tradeoffs among the alternatives; and
  - (d) the agency's preferred alternative, if any.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

## MONT. ADMIN. R. 12.2.436

## 12.2.436 PREPARATION AND CONTENTS OF DRAFT ENVIRONMENTAL IMPACT STATEMENTS

If required by these rules, the agency shall prepare a draft environmental impact statement using an interdisciplinary approach and containing the following:

- (1) a description of the proposed action, including its purpose and benefits;
- (2) a listing of any state, local, or federal agencies that have overlapping or additional jurisdiction and a description of their responsibility for the proposed action;
- (3) a description of the current environmental conditions in the area affected by the proposed action or alternatives, including maps and charts, whenever appropriate. The description must be no longer than is necessary to understand the effects of the action and alternatives. Data analysis must be commensurate with the importance of the impact with less important material summarized, consolidated, or simply referenced;
- (4) a description of the impacts on the quality of the human environment of the proposed action including:
  - (a) the factors listed in (3)(d) and (e) of ARM 12.2.432, whenever appropriate;
  - (b) primary, secondary, and cumulative impacts;
  - (c) potential growth-inducing or growth-inhibiting impacts;
  - (d) irreversible and irretrievable commitments of environmental resources, including land, air, water and energy;
  - (e) economic and environmental benefits and costs of the proposed action; and
  - (f) the relationship between local short-term uses of man's environment and the effect on maintenance and enhancement of the long-term productivity of the environment. Where a cost-benefit analysis is prepared by the agency prior to the preparation of the draft EIS, it shall be incorporated by reference in or appended to the EIS;
- (5) an analysis of reasonable alternatives to the proposed action, including the alternative of no action and other reasonable alternatives that may or may not be within the jurisdiction of the agency to implement, if any;
- (6) a discussion of mitigation, stipulations, or other controls committed to and enforceable by the agency or other government agency;
- (7) a discussion of any compensation related to impacts stemming from the proposed action;
- (8) an explanation of the tradeoffs among the reasonable alternatives;
- (9) the agency's preferred alternative, if any, and its reasons for the preference;
- (10) a section on consultation and preparation of the draft EIS that includes the following:
  - (a) the names of those individuals or groups responsible for preparing the EIS;
  - (b) a listing of other agencies, groups, or individuals who were contacted or contributed information; and
  - (c) a summary list of source materials used in the preparation of the draft EIS;
- (11) a summary of the draft EIS as required in ARM 12.2.435; and
- (12) other sections that may be required by other statutes in a comprehensive evaluation of the proposed action, or by the National Environmental Policy Act or other federal statutes governing a cooperating federal agency.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.437 ADOPTION OF DRAFT ENVIRONMENTAL IMPACT STATEMENT AS FINAL 1) Depending upon the substantive comments received in response to the draft EIS, the draft statement may suffice. The agency shall determine whether to adopt the draft EIS within 30 days of the close of the comment period on the draft EIS.

(2) In the event the agency determines to adopt the draft EIS, the agency shall notify the governor, the Environmental Quality Council, the applicant, if any, and all commenters of its decision and provide a statement

## MONT. ADMIN. R. 12.2.438

describing its proposed course of action. This notification must be accompanied by a copy of all comments or a summary of a representative sample of comments received in response to the draft statement, together with, at minimum, an explanation of why the issues raised do not warrant the preparation of a final EIS.

(3) The agency shall provide public notice of its decision to adopt the draft EIS as a final.

(4) If the agency decides to adopt the draft EIS as the final EIS, it may make a final decision on the proposed action no sooner than 15 days after complying with subsections (1) through (3) above.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

## 12.2.438 PREPARATION AND CONTENTS OF FINAL ENVIRONMENTAL IMPACT STATEMENT

Except as provided in ARM 12.2.437, a final environmental impact statement must include:

(1) a summary of major conclusions and supporting information from the draft EIS and the responses to substantive comments received on the draft EIS, stating specifically where such conclusions and information were changed from those which appeared in the draft;

(2) a list of all sources of written and oral comments on the draft EIS, including those obtained at public hearings, and, unless impractical, the text of comments received by the agency (in all cases, a representative sample of comments must be included);

(3) the agency's responses to substantive comments, including an evaluation of the comments received and disposition of the issues involved;

(4) data, information, and explanations obtained subsequent to circulation of the draft; and

(5) the agency's recommendation, preferred alternative, or proposed decision together with an explanation of the reasons therefor.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.439 TIME LIMITS AND DISTRIBUTION OF ENVIRONMENTAL IMPACT STATEMENTS 1) Following preparation of a draft EIS, the agency shall distribute copies to the governor, EQC, appropriate state and federal agencies, the applicant, if any, and persons who have requested copies.

(2) The listed transmittal date to the governor and the EQC must not be earlier than the date that the draft EIS is mailed to other agencies, organizations, and individuals. The agency shall allow 30 days for reply, provided that the agency may extend this period up to an additional 30 days at its discretion or upon application of any person for good cause. When preparing a joint EIS with a federal agency or agencies, the agency may also extend this period in accordance with time periods specified in regulations that implement the National Environmental Policy Act. However, no extension which is otherwise prohibited by law may be granted.

(3) In cases involving an applicant, after the period for comment on the draft EIS has expired, the agency shall send to the applicant a copy of all written comments that were received. The agency shall advise the applicant that he has a reasonable time to respond in writing to the comments received by the agency on the draft EIS and that the applicant's written response must be received before a final EIS can be prepared and circulated. The applicant may waive his right to respond to the comments on the draft EIS.

(4) Following preparation of a final EIS, the agency shall distribute copies to the governor, EQC, appropriate state and federal agencies, the applicant, if any, persons who submitted comments on or received a copy of the draft EIS, and other members of the public upon request.

(5) Except as provided by ARM 12.2.437(4), a final decision must not be made on the proposed action being evaluated in a final EIS until 15 days have expired from the date of transmittal of the final EIS to the governor and EQC. The listed transmittal date to the governor and EQC must not be earlier than the date that the final EIS is mailed to other agencies, organizations, and individuals.

## MONT. ADMIN. R. 12.2.440

(6) All written comments received on an EIS, including written responses received from the applicant, must be made available to the public upon request.

(7) Until the agency reaches its final decision on the proposed action, no action concerning the proposal may be taken that would:

- (a) have an adverse environmental impact; or
- (b) limit the choice of reasonable alternatives, including the no-action alternative.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.440 SUPPLEMENTS TO ENVIRONMENTAL IMPACT STATEMENTS 1) The agency shall prepare supplements to either draft or final environmental impact statements whenever:

- (a) the agency or the applicant makes a substantial change in a proposed action;
- (b) there are significant new circumstances, discovered prior to final agency decision, including information bearing on the proposed action or its impacts that change the basis for the decision; or
- (c) following preparation of a draft EIS and prior to completion of a final EIS, the agency determines that there is a need for substantial, additional information to evaluate the impacts of a proposed action or reasonable alternatives.

(2) A supplement must include, but is not limited to, a description of the following:

- (a) an explanation of the need for the supplement;
- (b) the proposed action; and
- (c) any impacts, alternatives or other items required by ARM 12.2.436 for a draft EIS or ARM 12.2.438 for a final EIS that were either not covered in the original statement or that must be revised based on new information or circumstances concerning the proposed action.

(3) The same time periods applicable to draft and final EISs apply to the circulation and review of supplements.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.441 ADOPTION OF AN EXISTING EIS 1) The agency shall adopt as part of a draft EIS all or any part of the information, conclusions, comments, and responses to comments contained in an existing EIS that has been previously or is being concurrently prepared pursuant to MEPA or the National Environmental Policy Act if the agency determines:

- (a) that the existing EIS covers an action paralleling or closely related to the action proposed by the agency or the applicant;
- (b) on the basis of its own independent evaluation, that the information contained in the existing EIS has been accurately presented; and
- (c) that the information contained in the existing EIS is applicable to the action currently being considered.

(2) A summary of the existing EIS or the portion adopted and a list of places where the full text is available must be circulated as a part of the EIS and treated as part of the EIS for all purposes, including, if required, preparation of a final EIS.

(3) Adoption of all or part of an existing EIS does not relieve the agency of the duty to comply with ARM 12.2.436.

(4) The same time periods applicable to draft and final EISs apply to the circulation and review of EISs that include material adopted from an existing EIS.

(5) The agency shall take full responsibility for the portions of a previous EIS adopted. If the agency disagrees with certain adopted portions of the previous EIS, it shall specifically discuss the points of disagreement.

## MONT. ADMIN. R. 12.2.441

(6) No material may be adopted unless it is reasonably available for inspection by interested persons within the time allowed for comment.

(7) Whenever part of an existing EIS or concurrently prepared EIS is adopted, the part adopted must include sufficient material to allow the part adopted to be considered in the context in which it was presented in the original EIS.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.442 INTERAGENCY COOPERATION 1) Whenever it is the lead agency responsible for preparation of an EIS, the agency may:

(a) request the participation of other governmental agencies which have special expertise in areas that should be addressed in the EIS;

(b) allocate assignments, as appropriate, for the preparation of the EIS among other participating agencies; and

(c) coordinate the efforts of all affected agencies.

(2) Whenever participation of the agency is requested by a lead agency, the agency shall make a good-faith effort to participate in the EIS as requested, with its expenses for participation in the EIS paid by the lead agency or other agency collecting the EIS fee if one is collected.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.443 JOINT ENVIRONMENTAL IMPACT STATEMENTS AND EA'S 1) Whenever the agency and one or more other state agencies have jurisdiction over an applicant's proposal or major state actions that individually, collectively, or cumulatively require an EIS and another agency is clearly the lead agency, the agency shall cooperate with the lead agency in the preparation of a joint EIS. Whenever it is clearly the lead agency, the agency shall coordinate the preparation of the EIS as required by this rule. Whenever the agency and one or more agencies have jurisdiction over an applicant's proposal or major state actions and lead agency status cannot be resolved, the agency shall request a determination from the governor.

(2) The agency shall cooperate with federal and local agencies in preparing EISs when the jurisdiction of the agency is involved. This cooperation may include, but is not limited to: joint environmental research studies, a joint process to determine the scope of an EIS, joint public hearings, joint EISs, and, whenever appropriate, joint issuance of a record of decision.

(3) Whenever the agency proposes or participates in an action that requires preparation of an EIS under both the National Environmental Policy Act and MEPA, the EIS must be prepared in compliance with both statutes and associated rules and regulations. The agency may, if required by a cooperating federal agency, accede to and follow more stringent requirements, such as additional content or public review periods, but in no case may it accede to less than is provided for in these rules.

(4) The same general provisions for cooperation and joint issuance of documents provided for in this rule in connection with EISs also apply to EAs.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.444 PREPARATION, CONTENT, AND DISTRIBUTION OF A PROGRAMMATIC REVIEW 1) Whenever the agency is contemplating a series of agency-initiated actions, programs, or policies which in part or in total may constitute a major state action significantly affecting the human environment, it shall prepare a programmatic review discussing the impacts of the series of actions.

(2) The agency may also prepare a programmatic review whenever required by statute, whenever a series of actions under the jurisdiction of the agency warrant such an analysis as determined by the agency, or whenever prepared as a joint effort with a federal agency requiring a programmatic review.



## MONT. ADMIN. R. 12.2.444

(3) The agency shall determine whether the programmatic review takes the form of an EA or an EIS in accordance with the provisions of ARM 12.2.430 and 12.2.431, unless otherwise provided by statute.

(4) A programmatic review must include, as a minimum, a concise, analytical discussion of alternatives and the cumulative environmental effects of these alternatives on the human environment. In addition programmatic reviews must contain the information specified in ARM 12.2.436 for EISs or ARM 12.2.432 for EAs, as applicable.

(5) The agency shall adhere to the time limits specified for distribution and public comment on EISs or EAs, whichever is applicable.

(6) While work on a programmatic review is in progress, the agency may not take major state actions covered by the program in that interim period unless such action:

- (a) is part of an ongoing program;
- (b) is justified independently of the program; or
- (c) will not prejudice the ultimate decision on the program. Interim action prejudices the ultimate decision on the program if it tends to determine subsequent development or foreclose reasonable alternatives.

(7) Actions taken under subsection (6) must be accompanied by an EA or an EIS, if required.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

#### 12.2.445 RECORD OF DECISION FOR ACTIONS REQUIRING POLICY ACT ENVIRONMENTAL IMPACT STATEMENTS

1) At the time of its decision concerning a proposed action for which an EIS was prepared, the agency shall prepare a concise public record of decision. The record, which may be integrated into any other documentation of the decision that is prepared by the agency, is a public notice of what the decision is, the reasons for the decision, and any special conditions surrounding the decision or its implementation.

(2) The agency may include in the final EIS, in addition to a statement of its proposed decision, preferred alternative, or recommendation on the proposed action, the other items required by (1), and additional explanation as provided for in (3) below. If the final decision and the reasons for that final decision are the same as set forth in the final EIS, the agency may comply with (1) by preparing a public notice of what the decision is and adopting by reference the information contained in the final EIS that addresses the items required by (1). If the final decision or any of the items required by (1) are different from what was presented in the final EIS, the agency is responsible for preparing a separate record of decision.

(3) There is no prescribed format for a record of decision, except that it must include the items listed in (1). The record may include the following items as appropriate:

- (a) brief description of the context of the decision;
  - (b) the alternatives considered;
  - (c) advantages and disadvantages of the alternatives;
  - (d) the alternative or alternatives considered environmentally preferable;
  - (e) short and long-term effects of the decision;
  - (f) policy considerations that were balanced and considered in making the decision;
  - (g) whether all practical means to avoid or minimize environmental harm were adopted, and if not, why not; and
  - (h) a summary of implementation plans, including monitoring and enforcement procedures for mitigation, if any.
- (4) This rule does not define or affect the statutory decision making authority of the agency.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

## MONT. ADMIN. R. 12.2.446

12.2.446 EMERGENCIES 1) The agency may take or permit action having a significant impact on the quality of the human environment in an emergency situation without preparing an EIS. Within 30 days following initiation of the action, the agency shall notify the governor and the EQC as to the need for the action and the impacts and results of it. Emergency actions must be limited to those actions immediately necessary to control the impacts of the emergency.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.447 CONFIDENTIALITY 1) Information declared confidential by state law or by an order of a court must be excluded from an EA and EIS. The agency shall briefly state the general topic of the confidential information excluded.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.448 RESOLUTION OF STATUTORY CONFLICTS 1) Whenever a conflicting provision of another state law prevents the agency from fully complying with these rules the agency shall notify the governor and the EQC of the nature of the conflict and shall suggest a proposed course of action that will enable the agency to comply to the fullest extent possible with the provisions of MEPA. This notification must be made as soon as practical after the agency recognizes that a conflict exists, and no later than 30 days following such recognition.

(2) The agency has a continuing responsibility to review its programs and activities to evaluate known or anticipated conflicts between these rules and other statutory or regulatory requirements. It shall make such adjustments or recommendations as may be required to ensure maximum compliance with MEPA and these rules.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.449 CONTRACTS AND DISCLOSURE 1) The agency may contract for preparation of an EIS or portions thereof. Whenever an EIS or portion thereof is prepared by a contractor, the agency shall furnish guidance and participate in the preparation, independently evaluate the statement or portion thereof prior to its approval, and take responsibility for its scope and content.

(2) A person contracting with the agency in the preparation of an EIS must execute a disclosure statement, in affidavit form prepared by the agency, specifying that he has no financial or other interest in the outcome of the proposed action other than a contract with the agency.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.450 PUBLIC HEARINGS 1) Whenever a public hearing is held on an EIS or an EA, the agency shall issue a news release legal notice to newspapers of general circulation in the area to be affected by the proposed action prior to the hearing. The news release or legal notice must advise the public of the nature of testimony the agency wishes to receive at the hearing. The hearing must be held after the draft EIS has been circulated and prior to preparation of the final EIS. A hearing involving an action for which an EA was prepared must be held after the EA has been circulated and prior to any final agency determinations concerning the proposed action. In cases involving an applicant, the agency shall allow an applicant a reasonable time to respond in writing to comments made at a public hearing, notwithstanding the time limits contained in ARM 12.2.439. The applicant may waive his right to respond to comments made at a hearing.

(2) In addition to the procedure in (1) above, the agency shall take such other steps as are reasonable and appropriate to promote the awareness by interested parties of a scheduled hearing.

(3) The agency shall hold a public hearing whenever requested within 20 days of issuance of the draft EIS by either:

- (a) 10% or 25, whichever is less, of the persons who will be directly affected by the proposed action;
- (b) by another agency which has jurisdiction over the action;
- (c) an association having not less than 25 members who will be directly affected by the proposed action; or

## MONT. ADMIN. R. 12.2.450

(d) the applicant, if any.

(4) In determining whether a sufficient number of persons have requested a hearing as required by subsection (3), the agency shall resolve instances of doubt in favor of holding a public hearing.

(5) No person may give testimony at the hearing as a representative of a participating agency. Such a representative may, however, at the discretion of the hearing officer, give a statement regarding his or her agency's authority or procedures and answer questions from the public.

(6) Public meetings may be held in lieu of formal hearings as a means of soliciting public comment on an EIS where no hearing is requested under (3) above. However, the agency shall provide adequate advance notice of the meeting; and, other than the degree of formality surrounding the proceedings, the objectives of such a meeting are essentially the same as those for a hearing.

(History: Sec. 2-3-103, 2-4-201, MCA; IMP, Sec. 2-3-104, 75-1-201, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

**12.2.451 FEES: DETERMINATION OF AUTHORITY TO IMPOSE** 1) Whenever an application for a lease, permit, contract, license or certificate is expected to result in the agency incurring expenses in excess of \$ 2,500 to compile an EIS, the applicant is required to pay a fee in an amount the agency reasonably estimates, as set forth in this rule, will be expended to gather information and data necessary to compile an EIS.

(2) The agency shall determine within 30 days after a completed application is filed whether it will be necessary to compile an EIS and assess a fee as prescribed by this rule. If it is determined that an EIS is necessary, the agency shall make a preliminary estimate of its costs. This estimate must include a summary of the data and information needs and the itemized costs of acquiring the data and information, including salaries, equipment costs and any other expense associated with the collection of data and information for the EIS.

(3) Whenever the preliminary estimated costs of acquiring the data and information to prepare an EIS total more than \$ 2,500, the agency shall notify the applicant that a fee must be paid and submit an itemized preliminary estimate of the cost of acquiring the data and information necessary to compile an EIS. The agency shall also notify the applicant to prepare and submit a notarized and detailed estimate of the cost of the project being reviewed in the EIS within 15 days. In addition, the agency shall request the applicant to describe the data and information available or being prepared by the applicant which can possibly be used in the EIS. The applicant may indicate which of the agency's estimated costs of acquiring data and information for the EIS would be duplicative or excessive. The applicant must be granted, upon request, an extension of the 15-day period for submission of an estimate of the project's cost and a critique of the agency's preliminary EIS data and information accumulation cost assessment.

(History: Sec. 75-1-202, MCA; IMP, Sec. 75-1-202, 203, 205, 206 and 207, MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

**12.2.452 FEES: DETERMINATION OF AMOUNT** 1) After receipt of the applicant's estimated cost of the project and analysis of an agency's preliminary estimate of the cost of acquiring information and data for the EIS, the agency shall notify the applicant within 15 days of the final amount of the fee to be assessed. The fee assessed must be based on the projected cost of acquiring all of the information and data needed for the EIS. If the applicant has gathered or is in the process of gathering information and data that can be used in the EIS, the agency shall only use that portion of the fee that is needed to verify the information and data. Any unused portion of the fee assessed may be returned to the applicant within a reasonable time after the information and data have been collected or the information and data submitted by the applicant have been verified, but in no event later than the deadline specified in these rules. The agency may extend the 15-day period provided for review of the applicant's submittal but not to exceed 45 days if it believes that the project cost estimate submitted is inaccurate or additional information must be obtained to verify the accuracy of the project cost estimate. The fee assessed must not exceed the limitations provided in 75-1-203(2), MCA.

(2) If an applicant believes that the fee assessed is excessive or does not conform to the requirements of this rule or Title 75, chapter 1, part 2, MCA, the applicant may request a hearing pursuant to the contested case provisions of the Montana Administrative Procedure Act. If a hearing is held on the fee assessed as authorized by this subsection, the agency shall proceed with its analysis of the project wherever possible. The fact that a hearing has been requested is not

## MONT. ADMIN. R. 12.2.452

grounds for delaying consideration of an application except to the extent that the portion of the fee in question affects the ability of the department to collect the data and information necessary for the EIS.

(History: Sec. 75-1-202 MCA; IMP, Sec. 75-1-202, 75-1-203, 75-1-205, 75-1-206 and 75-1-207 MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.453 USE OF FEE 1) The fee assessed hereunder may only be used to gather data and information necessary to compile an EIS. No fee may be assessed if an agency intends only to compile an EA or a programmatic review. If a department collects a fee and later determines that additional data and information must be collected or that data and information supplied by the applicant and relied upon by the agency are inaccurate or invalid, an additional fee may be assessed under the procedures outlined in these rules if the maximum fee has not been collected.

(2) Whenever the agency has completed work on the EIS, it shall submit to the applicant a complete accounting of how any fee was expended. If the money expended is less than the fee collected, the remainder of the fee shall be refunded to the applicant without interest within 45 days after work has been completed on the final EIS.

(History: Sec. 75-1-202 MCA; IMP, Sec. 75-1-202, 75-1-203, 75-1-205, 75-1-206 and 75-1-207 MCA; NEW, 1988 MAR p. 2692, Eff. 12/23/88.)

12.2.454 ACTIONS THAT QUALIFY FOR A CATEGORICAL EXCLUSION 1) The following types of actions do not individually, collectively, or cumulatively require the preparation of an environmental assessment or an environmental impact statement unless the action involves one or more of the extraordinary circumstances stated in (2) below:

- (a) construction of riparian fences to protect streambanks;
- (b) minor improvements in fish habitat by placement of habitat improvement structures;
- (c) removal or modification of man-made obstructions in stream channels to provide or improve fish passage or to prevent loss of fish into diversions;
- (d) clean up of trash or debris in the river corridor;
- (e) vegetative bank stabilization projects;
- (f) spawning channel development to provide additional habitat for reproduction;
- (g) inventory, survey or engineering activities for design or development of plans for river restoration and future fisheries improvement program projects;
- (h) maintenance or repair of existing river restoration and future fisheries improvement program projects;
- (i) improvement in fish habitat in lakes or reservoirs that do not pose a hazard to navigation.

(2) The preparation of an environmental assessment or an environmental impact statement will be required if the project involves any of the following:

- (a) significant impacts to publicly owned parklands, recreation areas, wildlife refuges or significant historic sites;
- (b) disturbance to a streambed that is significant enough to require a temporary exemption from water quality standards for turbidity;
- (c) significant impact on air, noise, or water quality;
- (d) significant impact on the human environment that may result in relocations of persons or business;
- (e) substantial controversy on environmental grounds;
- (f) any other kind of significant environmental impact, including cumulative or secondary impacts.

(History: Sec. 2-3-103, 2-4-201 MCA; IMP, Sec. 2-3-104, 75-1-201 MCA; NEW, 1994 MAR p. 2129, Eff. 8/12/94; AMD, 1996 MAR p.153, Eff. 1/12/96.)

**Appendix 5. Private Property Act assessment checklist for compliance with Chapter 462,  
Laws of Montana (1995).**

## PRIVATE PROPERTY ASSESSMENT ACT CHECKLIST

The 54th Legislature enacted the Private Property Assessment Act, Chapter 462, Laws of Montana (1995). The intent of the legislation is to establish an orderly and consistent process by which state agencies evaluate their proposed actions under the "Takings Clauses" of the United States and Montana Constitutions. The Takings Clause of the Fifth Amendment of the United States Constitution provides: "nor shall private property be taken for public use, without just compensation." Similarly, Article II, Section 29 of the Montana Constitution provides: "Private property shall not be taken or damaged for public use without just compensation..."

The Private Property Assessment Act applies to proposed agency actions pertaining to land or water management or to some other environmental matter that, if adopted and enforced without compensation, would constitute a deprivation of private property in violation of the United States or Montana Constitutions.

The Montana State Attorney General's Office has developed guidelines for use by state agency to assess the impact of a proposed agency action on private property. The assessment process includes a careful review of all issues identified in the Attorney General's guidance document (Montana Department of Justice 1997). If the use of the guidelines and checklist indicates that a proposed agency action has taking or damaging implications, the agency must prepare an impact assessment in accordance with Section 5 of the Private Property Assessment Act. For the purposes of this EA, the questions on the following checklist refer to the following required stipulation(s):

***(LIST ANY MITIGATION OR STIPALTIONS REQUIRED, OR NOTE "NONE")***

*None*

### **DOES THE PROPOSED AGENCY ACTION HAVE TAKINGS IMPLICATIONS UNDER THE PRIVATE PROPERTY ASSESSMENT ACT?**

YES	NO	
_____	<u>  X  </u>	1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
_____	<u>  X  </u>	2. Does the action result in either a permanent or indefinite physical occupation of private property?
_____	<u>  X  </u>	3. Does the action deprive the owner of all economically viable uses of the property?
_____	<u>  X  </u>	4. Does the action deny a fundamental attribute of ownership?

- \_\_\_\_\_   X   5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If the answer is **NO**, skip questions 5a and 5b and continue with question 6.]
- \_\_\_\_\_ \_\_\_\_\_ 5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
- \_\_\_\_\_ \_\_\_\_\_ 5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
- \_\_\_\_\_   X   6. Does the action have a severe impact on the value of the property?
- \_\_\_\_\_   X   7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally? [If the answer is **NO**, do not answer questions 7a-7c.]
- \_\_\_\_\_ \_\_\_\_\_ 7a. Is the impact of government action direct, peculiar, and significant?
- \_\_\_\_\_ \_\_\_\_\_ 7b. Has government action resulted in the property becoming practically inaccessible, waterlogged, or flooded?
- \_\_\_\_\_ \_\_\_\_\_ 7c. Has government action diminished property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?

Taking or damaging implications exist if **YES** is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if **NO** is checked in response to questions 5a or 5b.

If taking or damaging implications exist, the agency must comply with Section 5 of the Private Property Assessment Act, to include the preparation of a taking or damaging impact assessment. Normally, the preparation of an impact assessment will require consultation with agency legal staff.



**Appendix 6. National Environmental Policy Act (NEPA) federal activities checklist  
(Form 3-2185) used by the US Fish and Wildlife Service**

# NEPA COMPLIANCE CHECKLIST

State: \_\_\_\_\_ Federal Financial Assistance Grant/Agreement/Amendment Number: \_\_\_\_\_  
Grant/Project Name: \_\_\_\_\_

This proposal ☐ is; ☐ is not completely covered by categorical exclusion \_\_\_\_\_ in 516 DM 2, Appendix \_\_\_\_\_; and/or 516 DM 6, Appendix \_\_\_\_\_.  
(check (✓) one) (Review proposed activities. An appropriate categorical exclusion must be identified before completing the remainder of the Checklist. If a categorical exclusion cannot be identified, or the proposal cannot meet the qualifying criteria in the categorical exclusion, or an extraordinary circumstance applies (see below), an EA must be prepared.)

## Extraordinary Circumstances:

Will This Proposal (check (✓) yes or no for each item below):

- | Yes                      | No                       |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Have significant adverse effects on public health or safety.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Have significant adverse effects on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds (Executive Order 13186); and other ecologically significant or critical areas under Federal ownership or jurisdiction. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2)(E)].   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Have a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Have significant adverse effects on properties listed or eligible for listing on the National Register of Historic Places as determined by either the bureau or office, the State Historic Preservation Officer, the Tribal Historic Preservation Officer, the Advisory Council on Historic Preservation, or a consulting party under 36 CFR 800.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Have significant adverse effects on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant adverse effects on designated Critical Habitat for these species.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Have the possibility of violating a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Have the possibility for a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898).  |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Have the possibility to limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Have the possibility to significantly contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112).   |

(If any of the above extraordinary circumstances receive a ☐ Yes ☐ No check (✓), an EA must be prepared.)

☐ Yes ☐ No This grant/project includes additional information supporting the Checklist.

## Concurrences/Approvals:

Project Leader: \_\_\_\_\_ Date: \_\_\_\_\_

State Authority Concurrence: \_\_\_\_\_ Date: \_\_\_\_\_

(with financial assistance signature authority, if applicable)

Within the spirit and intent of the Council of Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the grant/agreement/amendment:

- ☐ is a categorical exclusion as provided by 516 DM 6, Appendix 1 and/or 516 DM 2, Appendix 1. No further NEPA documentation will therefore be made.
- ☐ is not completely covered by the categorical exclusion as provided by 516 DM 6, Appendix 1 and/or 516 DM 2, Appendix 1. An EA must be prepared.

## Service signature approval:

RO or WO Environmental Coordinator: Lauren R. Lamb Date: 6/1/06  
Staff Specialist, Division of Federal Assistance: \_\_\_\_\_ Date: \_\_\_\_\_  
(or authorized Service representative with financial assistance signature authority)

## **EXHIBIT D**



## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES  
MONTANA FIELD OFFICE  
585 SHEPARD WAY

HELENA, MONTANA 59601

PHONE (406) 449-5225, FAX (406) 449-5339

#### Memorandum

May 8, 2006

**To:** Assistant Regional Director, Ecological Services, Region 6

**From:** Field Supervisor, Ecological Services, Helena, Montana *P. Mark Wilson*

**Subject:** Conference Opinion for the fluvial Arctic grayling Candidate Conservation Agreement with Assurances

This document transmits the Fish and Wildlife Service's Conference Opinion based on our review of the application for a Enhancement of Survival Permit (Permit) associated with an Umbrella Candidate Conservation Agreement with Assurances (CCAA) between the Montana Fish, Wildlife and Parks (MFWP) and the Fish and Wildlife Service (Service) for fluvial Arctic grayling (*Thymallus arcticus*) in the upper Big Hole River watershed, southwestern Montana, in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 et seq). The Service received the Permit application and draft CCAA on April 1, 2005 and a revised and expanded draft CCAA on August 22, 2005. A draft Environmental Assessment (DEA) jointly prepared by the Service and MFWP was completed in October 2005. The Permit application, CCAA, and a Draft Environmental Assessment (DEA) were made available for public comment for 60 days on November 23, 2005. Minor revisions to the draft CCAA were completed on March 30, 2006.

An intra-Service biological evaluation was completed to evaluate effects of the proposed action on federally listed and candidate species. The biological evaluation was completed on September 13, 2005 and concluded that the proposed action may affect, and is likely to adversely affect the fluvial Arctic grayling; may affect, but is not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*); and will have no effect on Canada lynx (*Lynx canadensis*) and grey wolf (*Canis lupus*).

The biological evaluation's "no effect" determination for gray wolf assumed that the species was not present in the action area because they had been removed by State and Federal wildlife managers. However, the biological evaluation concluded that *if* gray wolves were present, they may be affected by the CCAA, but that the CCAA was not likely to jeopardize the continued existence of the species. Wolves have been reported in the action area since the completion of the biological evaluation (US Fish and Wildlife

Service 2005). Wolves in the Big Hole River watershed (outside units of the National Park Service) are designated as part of a nonessential experimental population area and are treated as proposed species for section 7 purposes. As such, Federal agencies are only required to confer with the Service when they determine that an action they authorize, fund, or carry out "is likely to jeopardize the continued existence" of the species. Since the existing biological evaluation concluded that (should gray wolves be present) the CCAA is not likely to jeopardize their continued existence, no further section 7 evaluation with respect to gray wolf is required in this conference opinion.

This conference opinion is based on information contained in the CCAA, the DEA, the intra Service biological evaluation, the Service's candidate assessment forms and federal register notices for fluvial Arctic grayling, information contained in scientific literature, and other sources of information. A complete administrative record of this consultation is on file in the Service's Montana Office, Helena, Montana.

## I. DESCRIPTION OF PROPOSED ACTION

The proposed action is issuance of a section 10(a)(1)(A) Enhancement of Survival Permit (Permit) to the MFWP by the Service to implement an umbrella CCAA for fluvial Arctic grayling in the upper Big Hole River, Montana. The stated goal of the CCAA is to secure and enhance populations of grayling within the historic range of the species in the upper reaches of the Big Hole River drainage (Montana Fish, Wildlife and Parks et al. 2006).

The majority of presently-occupied fluvial Arctic grayling habitat in the Big Hole River is located adjacent to non-Federal lands. Therefore, the survival and recovery of the species is closely associated with the current and future land and water uses occurring on the non-Federal lands. The potential for an ESA listing of fluvial Arctic grayling has raised concerns for land use restrictions on these properties. The large spatial scale at which habitat must be protected and restored emphasizes the need for a more comprehensive, collaborative, and long-term approach to fluvial Arctic grayling conservation in the Big Hole River. Therefore, there is an obvious need to secure the cooperation of those non-Federal landowners in the Big Hole River watershed who reside within the range of the species to promote the implementation of land and water uses that would be beneficial to the fluvial Arctic grayling. Degraded conditions in the Big Hole River require that land and water use activities in the watershed will need to be modified to improve, maintain and protect fluvial Arctic grayling habitat and help conserve the species.

The umbrella CCAA could include an area up to approximately 382,000 acres in the Big Hole River watershed upstream from Dickie Bridge (roughly located at T1N R12W S11). Up to 318 non-Federal property owners would be able to enroll in the CCAA through Certificates of Inclusion that require implementation of an approved site-specific plan for their property. The proposed duration of the permit associated with the CCAA is 20 years, and the minimum duration of Certificates of Inclusion is 10 years.



The action area for the proposed CCAA would thus be the 382,000 acres described above, more than 80 miles (128 km) of the Big Hole River and its associated tributaries, and a segment of the Big Hole River downstream from the CCAA project area. The action area includes river habitat downstream from the geographic extent of the CCAA project area because the proposed CCAA's affect on instream flow should also extend downstream. The Service establishes the downstream riverine boundary of the action area as the confluence with the Wise River, which is the Big Hole's next major tributary. The relative effect of the CCAA's increase in instream flows in the Big Hole River should be attenuated by the input of the Wise River. Arctic grayling are migratory and individuals may move into and out of the project area and may also move into and out of the action area.

The CCAA would be a partnership between Participating Landowners and the Agencies [MFWP, USDA Natural Resources Conservation Service (NRCS), Montana Department of Natural Resources and Conservation (DNRC) and the Service]. Participating Landowners would implement, or coordinate with the Agencies to implement, fluvial Arctic grayling conservation measures on their land as identified in the CCAA and in their individual site-specific plans. Each of the agencies would have specific compliance and effectiveness monitoring duties under the terms of the CCAA.

The CCAA and site-specific plans would describe specific land-use activities and conservation practices that would be beneficial to the species on non-Federal lands. In exchange for volunteering to implement beneficial practices for fluvial Arctic grayling, the participating landowners would receive incidental take authorization (at a specified level) under the Permit and would receive assurances from the Service that their agricultural and ranching activities would not be curtailed beyond what was stipulated in the CCAA and their individual site-specific plans if the species is subsequently listed under the ESA. The Permit would become effective if the fluvial Arctic grayling was subsequently federally listed, and would then authorize a level of 'take' for each enrolled landowner. Thus, an operational conservation program would be in place that would improve the quality and extent of Arctic grayling habitat, and the participating non-Federal landowners would benefit by receiving incidental take exemption and assurances that they can continue with agreed upon land uses.

Conservation measures to be implemented under the Agreement and in each Participating Landowner's comprehensive site-specific plan, as applicable, can be grouped into four general categories--1) improving instream flows, 2) conserving or restoring riparian habitats, 3) removing barriers to fluvial Arctic grayling movement, and 4) addressing entrainment threats. Examples of specific actions under each of the general measures are listed below.

1. **Improving Instream Flows.** Specific actions include, but are not limited to--
  - 1) upgrading irrigation structures to improve control over water diversion and delivery;
  - 2) compliance with water rights;
  - 3) repairing leaking head gates and water diversion structures;
  - 4) reducing irrigation withdrawals;
  - 5) improving irrigation ditches to reduce water losses;
  - 6) installing and maintaining off-stream livestock

watering facilities; 7) investigating and using alternative less water intensive livestock forage; and 8) implementing a comprehensive irrigation water management plan developed by NRCS.

2. **Conserving or Restoring Riparian Habitats.** Specific actions include, but are not limited to--1) installing and maintaining fences that manage livestock within or exclude livestock from the riparian zones; 2) installing and maintaining off-stream livestock watering facilities; 3) replanting or transplanting native riparian vegetation such as willows; 4) implementing prescribed grazing plans; and 5) curtailing or relocating any ranching activities that degrade riparian habitats.
3. **Removing Barriers to Fluvial Arctic Grayling Movement.** Specific actions include, but are not limited to--1) removing physical barriers to restore a “natural” stream channel; 2) installing fish ladders or other appropriate fish passage devices to permit fluvial Arctic grayling movement past irrigation structures (diversions) at all flows; and 3) redesigning and reconstructing diversion structures to facilitate fish passage where ladders or retrofitting is not feasible.
4. **Addressing Entrainment Threats.** Specific actions include, but are not limited to--1) permitting the Agencies access to irrigation ditches to perform surveys leading to a comprehensive assessment of entrainment threats; 2) allowing the Agencies to rescue entrained fluvial Arctic grayling; and 3) installing fish screens or other fish-exclusion devices as necessary to eliminate specific entrainment problems.

Complementary conservation measures or actions implemented by Participating Landowners under the CCAA that would benefit fluvial Arctic grayling include:

1. Allowing the Agencies to conduct an assessment of baseline environmental conditions and land use practices necessary to develop a comprehensive site-specific plan for their enrolled lands. Implementation of the site-specific plan, would meet the conservation guidelines of this Agreement.
2. Allowing translocation of fluvial Arctic grayling into suitable unoccupied habitats in streams on or adjacent to their enrolled lands to expand the distribution and abundance of fluvial Arctic grayling.
3. With agreed-to notification, allow agency or agency representative access to Participating Landowner’s property for the purposes of--1) assessing the fishery resources and status of fluvial Arctic grayling in natural streams and irrigation ditches; 2) salvage of entrained fish in irrigation ditches; 3) removing barriers; 4) assessing riparian habitat conditions and associated land-use activities; 5) implementing conservation measures, and conducting compliance; and 6) biological monitoring pursuant to the Agreement and site-specific plan.
4. Actively pursuing funding, as necessary, to implement the Agreement and site-specific plans.

The CCAA also contains extensive compliance and effectiveness monitoring and reporting provisions (Montana Fish, Wildlife and Parks et al. 2006). The Permit would

authorize incidental take of fluvial Arctic grayling for the following activities that are performed in accordance with applicable local, State and Federal laws: livestock ranching, agriculture and ranching (i.e., crop, hay and livestock production and farm equipment operation; diversion of water for irrigation), and restoration and monitoring activities required by the CCAA (e.g., installation/replacement of irrigation structures, installation of fish screens and fish ladders, channel restoration, biological monitoring of grayling). The CCAA also requires monitoring and reporting of any incidental take of fluvial Arctic grayling and requires participating landowners to notify the Service and MFWP prior to any activity that is expected to result in take, so the agencies have the opportunity to rescue potentially affected individuals.

Over 40 landowners encompassing over 235,000 acres (or >60% of the project area) have expressed to MFWP their intention to enroll in the CCAA should it be approved and executed by the Service.

## II. STATUS OF THE SPECIES

Based on the best scientific and commercial data, we have determined that no federally listed species (nor any designated critical habitat) or candidate species, other than fluvial Arctic grayling, will be adversely affected by the proposed action.

### A. Species Description and Taxonomy

Arctic grayling are salmonid fishes having elongate, laterally compressed bodies with deeply forked tails, and adults typically average 254-330 millimeters (10-13 inches) in length. Coloration varies from silvery or iridescent blue and lavender, to dark blue (Behnke 2002). During the spawning period, the colors darken and the males become more brilliant than the females. A prominent morphological feature of Arctic grayling is the sail-like dorsal fin, which is large and vividly colored with rows of orange to bright green spots, and often has an orange border. Dark spots are often evident on the body towards the head (Behnke 2002).

Arctic grayling belongs to the family Salmonidae (salmon, trout, charr, whitefishes), subfamily Thymallinae (graylings), and is represented by a single genus, *Thymallus*, which contains three other recognized species in addition to *T. arcticus* (Scott and Crossman 1973; Behnke 2002). Arctic grayling have a primarily holarctic distribution and are native to Arctic Ocean drainages of northwestern Canada and Alaska, from the Peace, Saskatchewan and Athabasca river drainages in Alberta eastward to Hudson Bay and westward to the Bering Straits and eastern Siberia and northern Eurasia (Scott and Crossman 1973). Arctic grayling are also native to Pacific coast drainages of Alaska and Canada as far south as the Stikine River in British Columbia.

In North America, two disjunct populations of Arctic grayling that were isolated by Pleistocene glaciations have been recorded outside of Canada and Alaska (Vincent 1962). The first was found in streams and rivers of the Great Lakes region of northern Michigan,



but these grayling were extirpated in the 1930s (Scott and Crossman 1973). The second isolated population historically inhabited watersheds in the upper Missouri River basin above Great Falls, Montana. Prior to the last glacial period, the upper portion of the Missouri River is believed to have been connected to the upper Saskatchewan River until it was diverted southward into the Mississippi River by the Laurentide ice sheet (Pielou 1991). Thus, Arctic grayling native to the Missouri River system were most likely isolated geographically from Hudson Bay and Arctic Ocean drainages by the onset of Wisconsin glaciation approximately 80,000 years ago (Pielou 1991; Redenbach and Taylor 1999). Arctic grayling in the upper Missouri River basin are commonly referred to as "Montana grayling" and have been variously categorized as a separate species (*T. montanas*; Scott and Crossman 1973) or subspecies (*T. a. montanus*; Williams et al. 1989), but these designations are not widely accepted. Arctic grayling in the upper Missouri River basin represent the southern extent of the species' range.

In general, Arctic grayling exhibit life-history and migratory forms present in other species of inland trout and charr, including fluvial, adfluvial and lacustrine. Fluvial (stream and river-dwelling) populations are characterized by a complex cycle of migratory behavior over their lifespan between spawning, feeding, and overwintering habitats within rivers and/or streams (Northcote 1995). Kaya (1990, 1992a) reviewed historical accounts of Arctic grayling and concluded that the fluvial (river-dwelling) form was the dominant life history for the upper Missouri River basin.

#### B. Life History & Ecology

Fluvial Arctic grayling typically migrate upstream to spawn in tributary or mainstem river locations and downstream to overwintering habitats. Such movement patterns have been observed in Arctic grayling in the Big Hole River, Montana (Oswald and Shepard 1989). Trophic migrations to feeding habitats may occur if these locations differ from spawning or overwintering habitats (Kaya 1990). Overall, movements by fluvial populations within and among tributaries and mainstem rivers may cover hundreds of kilometers (Armstrong 1985). Fluvial Arctic grayling in the Big Hole River system, Montana have been shown to migrate in excess of 80 km (50 miles) between spawning, feeding and wintering areas (Shepard and Oswald 1989; Magee and Lamothe 2003). Vincent (1962) and Kaya (1992a) concluded that the fluvial form was the dominant life history type expressed in Arctic grayling native to waters of the upper Missouri River, based on historical observations of grayling throughout rivers and the paucity of accessible lakes.

Age at maturity and longevity in Arctic grayling varies regionally and is probably related to growth rate, with populations in colder, northern latitudes maturing at later ages and having a greater lifespan (Northcote 1995 and references therein). Arctic grayling in the Big Hole River system typically mature at age 2 (males) or age 3 (females), and individuals greater than age 6 are rare (Kaya 1990; Magee and Lamothe 2003).

Arctic grayling are spring spawners. In Montana, Arctic grayling typically spawn from late April to mid-May by depositing adhesive eggs over gravel substrate without excavating a nest or redd (Shepard and Oswald 1989; Kaya 1990). In general, the

reproductive ecology of Arctic grayling is somewhat different from other salmonid species (trout and salmon) in that Arctic grayling eggs tend to be comparatively small, thus they have higher relative fecundity; and males establish and defend spawning territories rather than defending access to females (Northcote 1995). The time required for development of eggs from embryo until they emerge from stream gravel and become swim-up fry varies with water temperature, but averages about three weeks for Arctic grayling in the upper Missouri River basin (Kaya 1990). Small, weakly swimming fry (young-of-the-year) Arctic grayling prefer low velocity stream habitats (Kaya 1990; Northcote 1995).

Arctic grayling of all ages feed primarily on aquatic and terrestrial invertebrates captured on or near the water surface (Northcote 1995; Behnke 2002). Feeding locations for individual fish are typically established and maintained through size-mediated dominance hierarchies (e.g., Hughes 1992). Arctic grayling will also feed opportunistically on fish and fish eggs (Northcote 1995 and references therein; Behnke 2002).

Although Arctic grayling may have specific habitat requirements depending on their life stage (e.g., fry) and ecological activity (e.g., spawning), individuals inhabiting streams and rivers spend much of their time in pool habitat (Liknes 1981; Kaya 1990 and references therein; Lamothe and Magee 2003, 2004). Vincent (1962) concluded that Arctic grayling in Montana typically resided in streams with low-to-moderate gradient (<4%) and prefer low-to-moderate water velocities (<60 cm/sec). Observations of Arctic grayling habitat use in the Big Hole River by Liknes (1981) and Liknes and Gould (1987) are consistent with these generalizations.

Arctic grayling generally prefer cool or cold-water habitats. Selong et al. (2001) placed Arctic grayling in a “coldwater” group of salmonids, along with Arctic charr and bull trout, based on critical thermal maximum values. Hubert et al. (1985) conducted a habitat suitability index study for Arctic grayling and concluded that thermal habitat was optimal between 7-17°C, but became unsuitable above 20°C (68°F). Lohr et al. (1996) conducted lab experiments with Arctic grayling from the Big Hole River and determined that the upper incipient lethal temperature was 25°C (77°F) and the critical thermal maximum ranged from 26-29°C (79-84°F) depending on acclimation temperature. The upper incipient lethal temperature was defined as the temperature that is survivable indefinitely (for periods longer than 1 week) by 50% of the “test population” in an experimental setting, and the critical thermal maximum was considered to functionally equivalent to the temperature causing instantaneous death (Lohr et al. 1996). A thorough description of the taxonomy and life history of fluvial Arctic grayling is also published in the Service’s 1994 twelve-month administrative petition finding (59 FR 37738; July 25, 1994).

### C. Distribution and Status

Vincent (1962) and Kaya (1992a) synthesized accounts of Arctic grayling occurrence and abundance from historical surveys and contemporary monitoring to determine the

historical distribution of the species in the upper Missouri River system. The Service bases its conclusions about the historical distribution of Arctic grayling in region on these two reviews. Arctic grayling of the upper Missouri River basin were widely but irregularly distributed above the Great Falls in Montana and in northwest Wyoming within the present-day location of Yellowstone National Park (Vincent 1962); and were estimated to inhabit up to 2000 km (1250 miles) of stream habitat until the early 20th century (Kaya 1990, 1992a).

Fluvial Arctic grayling were documented in the drainages of the Sun, Smith, Jefferson, Beaverhead, Big Hole, Madison, Gallatin, Gibbon, and Firehole Rivers; and Grayling, Bridger, Bozeman, and Fan Creeks (Kaya 1990, 1992a). The distribution of native Arctic grayling in the upper Missouri River apparently went through a dramatic decline in the first 50 years of the 20<sup>th</sup> century (Vincent 1962; Kaya 1992a). The indigenous populations that formerly resided in the Smith, Sun, Jefferson, Beaverhead, Gallatin and Ruby river drainages; and Grayling, Bridger, Bozeman, and Fan creeks are believed extirpated (Kaya 1990, 1992b).

The remaining indigenous “fluvial” populations appear to be confined to the Big Hole River and the Madison River upstream from Ennis Reservoir. Presently, the only confirmed self-sustaining remnant of the indigenous fluvial Arctic grayling population in the upper Missouri River basin exists in the Big Hole River and some of its tributaries (Montana), an area estimated to represent 5 percent or less of the historical range (Kaya 1992a). A remnant native Arctic grayling population also exists in the Madison River near Ennis Reservoir. This Madison River-Ennis Reservoir population was presumably fluvial before construction of the dam that created Ennis Reservoir in 1906, however the population now exhibits an adfluvial life history (spawning in the river, rearing in the reservoir). Big Hole River and Madison River-Ennis Reservoir grayling appear to be genetically quite similar (Leary 1990), so the Service considers these two populations the remaining remnants of the once widespread fluvial life history in the upper Missouri River basin. Kaya (1992a) estimated that the fluvial Arctic grayling has been extirpated from about 95% of its historic range.

#### *Fluvial Arctic grayling in the Big Hole River*

Contemporary monitoring of the fluvial Arctic grayling in the Big Hole River by Montana Fish, Wildlife and Parks has involved spring electrofishing to characterize the abundance and composition of the spawning run and fall electrofishing to provide an index of abundance and to estimate recruitment (e.g., Magee and Lamothe 2003). In general, these monitoring efforts since the early 1980s have focused on a 7-13 mile segment of the river near Wisdom, variously referred to as the Wisdom reach, McDowell or “McWisdom” (includes Steel Creek otherwise known as “Wisdom East”) that is believed to be an important historical spawning and rearing location for the fluvial life history. Other spawning locations have been noted, for example in the mainstem river between Sand Hollow and Pintlar creek and near the confluences of Squaw and Sawlog Creeks, and were more closely monitored during the late 1980s and early 1990s (R.

Oswald, Montana Fish, Wildlife and Parks, pers. comm.). Other frequently sampled locations include the lower reaches of connected tributary streams and other mainstem river segments containing deep pools. Data from spring electrofishing surveys are not considered suitable for assessing abundance in the population because of variability in sampling efficiency (e.g., high flows and turbidity) and unequal sampling effort across years.

Kaya (1992a) notes the general paucity of monitoring data for the Big Hole River fluvial Arctic grayling population prior to the late 1970s, but data collected since that time indicate the overall range of the fluvial population in the Big Hole River has contracted over the last two decades. Liknes (1981) observed that Arctic grayling were present in Governor Creek (headwaters) and downstream in Big Hole River near Melrose. Arctic grayling have not recently been encountered in Governor Creek (Montana Fish, Wildlife and Parks, Dillon, MT, unpublished data); and are encountered in the Big Hole River downstream of Divide, Montana at very low densities and as far downstream as Melrose, Montana (Oswald 2005; R. Oswald, Montana Fish, Wildlife and Parks, Dillon, MT, pers. comm.). Presence and density of Arctic grayling in the Big Hole River downstream of Divide may be related to annual flow conditions (Oswald 2005). More recently the data indicate Arctic grayling have become less abundant in historical spawning and rearing locations in the upper watershed near Wisdom and also in downstream river segments with deep pool habitats considered important for overwintering. Comparatively greater numbers of Arctic grayling are encountered in the lower reaches of tributaries to the upper Big Hole River.

The abundance of age-1 and older (age-1+) Arctic grayling in the vicinity of Wisdom, Montana has fluctuated in the time frame considered, but appears to be at its lowest recorded levels. The highest density of Arctic grayling in this area was recorded in 1983 (111 per mile, standard deviation = 50), and more recently peaked in 1997 (96 per mile, standard deviation = 66; Table 1) following successive years of average to higher than average streamflows (e.g., Magee and Byorth 1998). Since 1997, the abundance of Arctic grayling in that location has declined precipitously (Table 1). Unfavorable environmental conditions precluded sampling in 2000-01, but during the last four years few age-1+ grayling have been captured and mark-recapture population estimates have not been possible. Among the potential hypotheses to explain this trend include significant decline of this grayling from this location (i.e., decline segment of the population that spawns in this location), the dispersal of individuals prior to sampling (such that their presence is not recorded), reduced post-spawning occupancy by age-1 and older grayling because of unsuitable habitat, or some combination of these three. Whichever hypothesis (or hypotheses) account for the observed low abundance, the proximate mechanisms underlying the hypotheses all seem to indicate decreased habitat suitability for grayling.

Deep pools in the mainstem Big Hole River between the confluences of Fishtrap Creek and Wise River (e.g., Fishtrap, Sawlog and Sportsman's pools) are believed to be important overwintering habitat for Arctic grayling (e.g., Shepard and Oswald 1989). The catch rates of age-1+ Arctic grayling in these pools during 2004 and 2005 were the

lowest recorded during the period 1988 to present, and has exhibited a negative trend since 2002 (Montana Fish, Wildlife and Parks, Dillon, MT, unpublished data).

Recent snorkeling and electrofishing data indicate that Arctic grayling can be comparatively abundant in the lower reaches of certain tributary streams with direct connection to the Big Hole, including Deep, Seymour, LaMarche, Fishtrap, Swamp, and Steel creeks (Magee and Lamothe 2004; Magee et al. 2005; Jim Magee, Montana FWP, unpublished data). For example, in 2004 the estimated density of Arctic grayling in the lower 1 mile of LaMarche Creek was 89 per mile (standard deviation=32) (Magee et al. 2005). Presence of young-of-the-year at these locations is consistent with the hypothesis that Arctic grayling use the lower reaches of these tributaries for spawning. These tributaries appear to be spawning and rearing locations and may also provide adults with refuge from high water temperatures during summer (e.g., Magee 2004). Arctic grayling may exist at high densities in specific reaches of some tributaries connected to the Big Hole River, but the Service considers it unlikely that the high Arctic grayling densities measured there are generally representative of grayling densities at unsampled locations in the mainstem river or other tributaries. Overall, the absolute abundance of fluvial Arctic grayling population in the Big Hole River and its tributaries appears to be very low.

**Table 1.** Estimated density of age 1+ (age 1 and older) fluvial Arctic grayling in the mainstem upper Big Hole River, near Wisdom, Montana, based on annual fall electrofishing surveys. Data are from 1992-2005 and span approximately three generations of Arctic grayling. Data from Magee and Lamothe (2003); Magee et al. (2005); and Montana Fish, Wildlife and Parks (unpublished).

Year	Age-1+ Arctic Grayling Density in no/mile (SD)
1992	31 (16)
1993	32 (22)
1994	65 (50)
1995	70 (62)
1996	64 (27)
1997	96 (66)
1998	76 (30)
1999	35 (8)
2000	Not sampled - no estimate <sup>a</sup>
2001	Not sampled - no estimate <sup>a</sup>
2002	Present – no estimate <sup>b</sup>
2003	Present - no estimate <sup>b</sup>
2004	Present - no estimate <sup>b</sup>
2005	Present - no estimate <sup>b</sup>

<sup>a</sup> No estimates were made in 2000 and 2001 because sampling was limited by extreme drought conditions (low flows and high temperatures).

<sup>b</sup> Grayling were present in 2002-05 but too few individuals were captured to calculate a mark-recapture population estimate.

Poor recruitment concurrent with regional drought conditions has produced a demographically imbalanced population. Recruitment of age-0 Arctic grayling into the population was very low during 1999-2002 and again in 2005 (fewer than 30 captured each year; Magee and Lamothe 2003, 2004; Magee et al. 2005; Montana Fish, Wildlife and Parks, Dillon, MT, unpublished data). However, comparatively strong recruitment ( $n=363$  age-0 captured) was observed in 2003 (Magee and Lamothe 2004) and fair recruitment was noted in 2004 ( $n=134$  age-0 captured; Magee et al. 2005). In addition to resulting in overall low abundance, the effect of consistently poor recruitment over a period comparable to the lifespan of the species has resulted in a skewed population structure such that adult grayling now appear to be rare (e.g., Magee et al. 2005), and on a percentage basis most of the population resides in a cohort that will not reach maturity until spring 2006. Successful reproduction of this cohort in 2006 would be an initial step to arrest the downward trend in the overall population.

A comprehensive population estimate of Arctic grayling in the mainstem Big Hole River was last conducted in 1993 (Byorth 1994). Two-pass mark-recapture electrofishing over approximately 105 km (66 miles) of habitat between the "McDowell" sample section (upstream from Wisdom, MT) and the Butte Water Intake facility (near Divide, Montana) resulted in a population estimate of 2,549 age-1+ grayling (95% confidence interval = 2,078). Drought conditions and logistic limitations have precluded similar estimates since that time.

The recent standardization of existing Arctic grayling electrofishing capture data permits the calculation of an index of abundance based on catch-per-unit effort (Montana Fish, Wildlife and Parks, Dillon, MT, unpublished data). These index values are derived from all locations sampled in a given year, and thus may provide an assessment of the trend in the population over the largest spatial extent possible. Proper application of indices of abundance (catch-per-unit effort or CPUE) to detect population trends requires that the index values are related to the true abundance (Thompson et al. 1998). Preliminary analyses indicates CPUE index values are positively and significantly correlated to quantitative density estimates based on mark-recapture data for four of five locations tested (correlation coefficient  $r = 0.76-0.82$  for significant correlations; Montana Fish, Wildlife and Parks, Dillon, MT, unpublished data). The Service tentatively concludes the index values are appropriate to characterize trends in the population provided the sample size and geographic extent are sufficient. Years where monitoring was minimal may produce biased index values, especially if sampling focused where grayling are known to occur. For example, the Service views the CPUE estimates from 1988 and 2001 as not accurately reflecting the abundance of grayling in the Big Hole River because only four locations totaling less than four miles were included in the sample (Table 2). In contrast, CPUE estimates from 1993 and 2003-2005 may be comparatively robust because of the large spatial extent of sampling.

Assuming the CPUE values adequately represent Arctic grayling abundance, the data indicate that age-1+ population fluctuated in abundance between 1989 and 1999, but began to significantly decline thereafter (Table 2; data from 1988 and 2001 excluded

because of small sample size). Index values for age-0 grayling are consistent with low recruitment from 1999-2002, with a pulse of recruitment in 2003 (Table 2). Most striking in terms of the overall population is the steep downward trend for age-1+ during 2003-05, culminating in the lowest index value (0.8) over the 16 year period. For comparison, the 2005 value (0.8) is only 15-22% of that estimated for 1993 (5.3 or 3.6; see Table 2) at which time the age-1+ fluvial population was estimated to be approximately 2,500. It is not statistically valid to derive a current population estimate using the 1993 estimate and the ratio between the 1993 and 2005 index values. However, the data strongly suggest that fluvial Arctic grayling in the Big Hole River may currently exist at their lowest recorded abundance and that the population has been in a downward trend.



**Table 2.** Summary of index of abundance (catch per unit effort per mile) based on one-pass electrofishing for age 1 and older (age-1+) and young of the year (age-0) Arctic grayling in the Big Hole River and connected tributaries at frequently sampled locations during 1988-2005. Data provided by Montana Fish, Wildlife and Parks, Dillon, MT; calculations by the Service. Data from 1983-87 not shown because only one or two sites were sampled in those years.

Year	No. sites sampled	Total distance (mi)	Catch per unit effort (per mile)	
			age-1+	age-0
1988	4	3.72	17.1	0.0
1989	5	15.32	5.5	-
1990	7	22.32	7.7	4.1
1991	6	15.32	3.5	0.9
1992	7	28.42	2.1	4.1
1993	10 (continuous) <sup>a</sup>	35.91 (63.6) <sup>a</sup>	5.3 (3.6) <sup>a</sup>	0.7 (0.5) <sup>a</sup>
1994	5	13.52	7.2	2.1
1995	8	28.42	5.5	2.0
1996	7	26.32	3.4	1.9
1997	8	31.8	6.5	1.2
1998	8	30.06	3.5	0.7
1999	7	21.72	7.0	0.5
2000	5	11.5	5.1	0.4
2001	4	3.72	19.6	0.3
2002	7	19.32	4.1	0.5
2003	11	25.56	4.3	18.1
2004	12	34.77	2.8	3.6
2005	21	52.37	0.8	0.6

<sup>a</sup> Data in parentheses are based on Arctic grayling captured by electrofishing a continuous 66.3 mile segment of the Big Hole River in 1993. Data from "frequently sampled locations", as determined by Montana Fish, Wildlife and Parks, were used to compare CPUE values among years. Thus in 1993, the age-1+ CPUE value based on the 10 frequently sampled sites was 5.3 whereas the corresponding CPUE value based on the continuous sampling was 3.6.

#### *Arctic grayling in the Madison River-Ennis Reservoir*

The historical decline in Arctic grayling abundance and distribution in the Madison River is fairly well documented; however recent monitoring data on the remnant population present in the vicinity of Ennis Reservoir is sparse. Byorth and Shepard (1990) draw on the historical reports presented in Vincent's (1962) treatise to characterize how the Arctic grayling population in the Madison River has fluctuated since initial records in the late 1880's. Arctic grayling were apparently common to plentiful in the Madison River and

some associated tributaries (Meadow and O'Dell creeks), but experienced a population decline concurrent with the completion of the Madison Dam in 1906. Vincent (1962) noted that after the construction of this dam that "early settlers reported scooping up boxes full of grayling at the base of Ennis Dam the year after it was constructed". The population may have rebounded somewhat in the following decades, but apparently became quite rare starting in the late 1930s (Vincent 1962). Based on angling catch rates, grayling may have increased in abundance in the late 1970s (Byorth and Shepard 1990), but the population was greatly reduced in 1983 apparently because of an extreme reservoir drawdown (Byorth and Shepard 1990). This drawdown was not part of normal dam operation and was intended as a one-time measure to reduce the density of aquatic macrophytes in the reservoir.

The current distribution of Arctic grayling in the Madison River is primarily restricted to the Ennis Reservoir and upstream into the river approximately 6.5 km (~4 miles) to the Valley Garden Fishing Access Site. Monitoring data indicates that Arctic grayling migrate from the reservoir into the river to spawn (e.g., Byorth and Shepard 1990), then return to the reservoir. Young-of-the-year Arctic grayling spawned in the Madison River migrate downstream into Ennis Reservoir about one month after emergence (Jeanes 1996). Arctic grayling were also presumed to spawn in Meadow Creek, a tributary to Ennis Reservoir (Jeanes 1996), but box traps operated in 1995 captured five species of fish but did not capture any grayling in the creek (Clancey 1996). Adult Arctic grayling are occasionally encountered in the Madison River outside of the spawning season (Clancey 1999) and as far away as 85 km from Ennis Reservoir, near the West Fork (Pat Clancey, Montana Fish, Wildlife and Parks, as cited in Jeanes 1996).

Byorth and Shepard (1990) conducted electrofishing, gillnetting, and angler creel surveys to document the use of the Madison River and its tributaries and Ennis Reservoir by Arctic grayling and rainbow trout. Electrofishing surveys in the river upstream from Ennis Reservoir during April-May 1990 captured a total of 24 adult Arctic grayling. No adult grayling were captured by similar electrofishing in July-August, but five young-of-the-year grayling were captured. These observations, in conjunction with capture of adult grayling at inlet areas of the Ennis Reservoir in May, are consistent with the hypothesis that adult Arctic grayling spawn in the Madison River and return to the reservoir soon after spawning (e.g., Byorth and Shepard 1990). A total of 14 Arctic grayling were captured by gillnetting in Ennis Reservoir between September 1989 and September 1990. Byorth and Shepard (1990) used a combination of angler captures ( $n=70$ ), individuals tagged during spring electrofishing ( $n=22$ ), and angler recapture of tagged fish ( $n=2$ ) to produce an "extremely rough" estimate of 545 adult (spawning) Arctic grayling (95% CI = 533). They concluded: "Although the accuracy of the estimate is questionable, the population is certainly small ( $<1000$ ), and extremely vulnerable to extirpation" and noted the need for more accurate population estimates (Byorth and Shepard 1990).

**Table 3.** Summary of Arctic grayling monitoring results and effort from the Madison River and Ennis Reservoir, 1991-2005. Electrofishing surveys for adults focused on the spawning run in the Madison River directly upstream from Ennis Reservoir during April and May. Seining was used to characterize the relative abundance of young-of-the-year Arctic grayling in Ennis Reservoir during the summer and fall at sample sites established by Jeanes (1996).

Year	Young-of-the-year in reservoir captured by seines	Adults in Madison River captured by electrofishing		Data source
		Number captured	Electrofishing effort (runs)	
1990	-	24	Not reported	Byorth and Shepard (1990)
1991	-	35	7	Clancey (1998)
1992	-	107	8	Clancey (1998)
1993	-	129	6	Clancey (1998)
1994	71	29	4	Jeanes (1996); Clancey (1998)
1995	35	11	4	Clancey (1998)
1996	0	19	7	Clancey (1998)
1997	1	No data	0	Clancey (1998)
1998	0	No data	0	Clancey (1999)
1999	2	No data	0	Clancey (2000)
2000	0	No data	0	Clancey (2001)
2001	0	No data	0	Clancey (2002)
2002	1	No data	0	Clancey (2003)
2003	0	No data	0	Clancey (2004)
2004	1	19	7 (21 "man days") <sup>a</sup>	Clancey (2005)
2005	0	No data	0	Clancey (2006)

<sup>a</sup> Effort described as 21 "man days" which represents a total of 7 effort days of electrofishing (=7 runs), where surveys with two electrofishing boats were conducted for 3 days and a single boat was used for one day (Pat Clancey, Montana Fish, Wildlife and Parks, Ennis, MT, pers. comm.).

Since 1990, monitoring of the Arctic grayling in the Madison River has been somewhat sporadic (Table 3). In general, the monitoring data can be divided into electrofishing to assess the number of grayling spawning in the Madison River and seining to capture young-of-the-year grayling in Ennis Reservoir to provide an index of recruitment. While seining has been conducted in each of the last 12 years, the electrofishing surveys to characterize the spawning run have only been conducted in seven years and were not conducted during 1997-2003 and in 2005. Given the inconsistent data, conclusions about the status of the population are best described as tentative. Based on the electrofishing surveys in 1993-93 when more grayling were captured, the Arctic grayling population

apparently increased from the levels reported in 1990 by Byorth and Shepard (1990). Fewer adult grayling were captured in 1994-95 but sampling effort was reduced compared to previous years. However, it does appear that the spawning run was reduced during 1994-96. Electrofishing surveys for spawning Arctic grayling were not conducted again until 2004, when a total of 19 age-1 and older Arctic grayling were captured in 21 "man days" of effort (equivalent to 7 runs, see Table 3).

Jeanes (1996) conducted surveys for age-0 Arctic grayling in the Madison River and Ennis Reservoir to characterize their distribution, habitat use, and association with other resident fish species. Over approximately a one month period between late May and late June 1994, he observed young-of-the-year grayling along stream margins in backwater or slackwater habitats in a braided channel section of the Madison River upstream from Ennis Reservoir. These fish had apparently emigrated into the reservoir by mid-July because they were absent from electrofishing samples. A total of 71 young-of-the-year Arctic grayling were captured by seining at 8 sites in Ennis Reservoir. Montana Fish, Wildlife and Parks has continued to annually seine for young-of-the-year Arctic grayling, but has never captured more than two individuals per year with the exception of 1995 (Table 3). Hypotheses to explain these low capture rates include reduced abundance of grayling, a shift in distribution or habitat use by grayling, reduced sampling effort, and reduced sampling efficiency. The Service is unable to determine which hypothesis is most plausible.

In October 2002, an angler identified age-0 grayling in the Madison River just upstream from Ennis Reservoir (Clancey 2003). In June 2005, a limited visual survey was conducted to detect presence of age-0 Arctic grayling the Madison River at some of the same locations where Jeanes (1996) conducted similar surveys. No age-0 grayling were observed in 8-9 hours of surveys during a single day (Pat Clancey, Montana Fish, Wildlife and Parks, Ennis, MT, pers. comm.).

Overall, the Service has little information on which to make a direct assessment of the Arctic grayling population in the Madison River near Ennis Reservoir. The data are not sufficient to estimate absolute abundance or detect a trend in survival or recruitment. Based on the similar number of adults captured in 1990 versus 2004 when comparable sampling effort was expended, the Service concludes that the current adult Arctic grayling abundance is probably no more than the estimate of 545 (95% CI = 533) derived by Byorth and Shepard in 1990. Arctic grayling continue to persist, but there appear to be few individuals in the population.

#### D. Analysis of the species likely to be affected

In 1982, the fluvial Arctic grayling was designated as a category 2 candidate for ESA listing. In response to a petition to list the grayling as endangered, the Service determined in 1994 that the fluvial Arctic grayling of the upper Missouri River was a valid distinct population segment (DPS) that was warranted for listing under the but precluded by higher priority listing actions (59 FR 37738). At that time, fluvial Arctic grayling was given a listing priority number 9, primarily because the ongoing cooperative prelisting

activities to improve habitat conditions in the Big Hole River and to reestablish populations in the historic range reduced the magnitude of the threats (see Fluvial Arctic Grayling Workgroup 1995; Montana Fish, Wildlife and Parks and U.S. Fish and Wildlife Service 1996). In 2004, the listing priority number of fluvial Arctic grayling was elevated to 3 (69 FR 24881, May 4, 2004) because the abundance of the remnant population in the Big Hole River declined substantially and cooperative efforts to establish additional fluvial populations in the Ruby, Sun, Beaverhead, Missouri headwaters, Madison, Gallatin and Jefferson rivers have not yet been fully successful (i.e., no self-sustaining populations). The listing priority number for fluvial Arctic grayling remains at 3 (70 FR 24870, May 11, 2005).

### III. ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. For the purposes of this biological opinion and the CCAA, the action area includes all terrestrial and wetlands habitats contained in the 380,000 acres in non-Federal lands in the upper Big Hole River watershed upstream from Dickie Bridge (primarily in Beaverhead and Deerlodge counties, MT) that can be enrolled in the proposed CCAA, the Big Hole River and associated tributaries adjacent to the potentially enrolled properties, and the Big Hole River downstream from Dickie Bridge to its confluence with the Wise River.

#### A. Status of fluvial Arctic grayling within the action area

The action area contains the majority of habitat occupied by the native fluvial Arctic grayling population in the Big Hole River. As discussed in "Distribution and Status", this population is at very low abundance, has experienced a recent decline, and its DPS has a listing priority of 3. The actual population size is unknown, but may be 500 or fewer adults. Arctic Grayling are known to be at least seasonally present in the Big Hole River and Deep, Fishtrap, LaMarche, Seymour, Steel, and Swamp creeks.

#### B. Factors affecting fluvial Arctic grayling environment within the action area

The factors affecting the fluvial Arctic grayling in the Big Hole River are summarized below in terms of the five threat factors the Service uses to make listing determinations. A thorough description of these factors can be found on the species' 2004 candidate assessment form ([http://ecos.fws.gov/docs/candforms\\_pdf/r6/E03Q\\_V01.pdf](http://ecos.fws.gov/docs/candforms_pdf/r6/E03Q_V01.pdf)).

##### 1. *The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.*

In the Big Hole River watershed, local land and water use has affected surface water hydrology, riparian zone conditions, stream morphology, thermal characteristics, and possibly nutrient inputs to the aquatic system (Kaya 1990; OEA 1995; Lohr et al. 1996; Lamothe and Magee 2004b; Confluence Consulting Inc. et al. 2003). The operation of irrigation systems in the Big Hole has apparently led to the direct fragmentation of stream habitats.

**Surface Water Hydrology** - The predominant land use in the upper Big Hole watershed is irrigated agriculture for hay production and livestock pasture. Irrigation demands on the system are very high because of the over allocation of water rights, the difficult to control and inefficient surface water (flood) irrigation systems, a recent shift to increased pasture grazing, and a continuing drought. These demands have resulted in significantly reduced instream flows that pose a major threat to grayling. Reduced streamflows can reduce the growth and survival of grayling through reducing the available habitat.

**Riparian Zone (Streamside) Conditions** - Riparian zones are critical for the ecological function of most aquatic systems (Gregory et al. 1991). Loss of riparian zones through streamside livestock grazing and direct removal of natural vegetation has led to degradation of adjacent stream habitat in the upper Big Hole River (OEA 1995; Confluence Consulting Inc. et al. 2003; Lamothe and Magee 2004b).

**Stream Morphology** - The combination of reduced instream flows and loss of riparian habitats in the Big Hole River has led to decreased channel stability, increased erosion, and channel widening (e.g., Confluence Consulting Inc. et al. 2003). In concert, these changes have led to habitat simplification such as a reduction in pool and riffle sequences. Reduced habitat diversity affects grayling by decreasing the distribution and frequency of necessary spawning, feeding and refuge habitats.

**Water Quality - Thermal Impairment and Nutrients** - Reduced stream flows during summer, reduced shading because of riparian vegetation removal, and channel widening are factors combining to increase water temperatures by making surface waters more sensitive to solar radiation. Thermal alterations via increased summer water temperatures pose a threat to grayling in the mainstem Big Hole River (e.g., Lohr et al. 1996; Magee and Lamothe 2004).

Nutrient enrichment may be a potential problem in the upper Big Hole River - (Confluence Consulting Inc. et al. 2003 and reference therein). Further data are needed to determine if nutrient enrichment is affecting water quality to the extent that grayling are being harmed. However, the potential for fertilizers applied to irrigated lands and livestock waste provide sources of nutrients to the river appears substantial given the surface (flood) irrigation techniques utilized in the upper Big Hole River basin.

**Habitat Fragmentation** - The presence and operation of irrigation diversions can fragment Arctic grayling habitat in at least two ways. First, cross channel diversions may block fish passage under all or some flow conditions, impeding grayling access to necessary spawning, rearing and refuge habitats. Second, irrigation diversions and ditches may

entrain (inadvertently capture) grayling (e.g., Shepard and Oswald 1989; Montana Fish, Wildlife and Parks et al. 2006).

## *2. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.*

Arctic grayling in the upper Big Hole River are handled for scientific and recreational purposes. The Service has no data to indicate that population monitoring (scientific utilization) conducted by MFWP is a threat to the grayling.

Arctic grayling are easily caught by anglers (e.g., Alberta Sustainable Resource Development 2005), and historical angling exploitation likely contributed to, or initiated, past declines or local extirpations throughout the upper Missouri River DPS (Vincent 1962). Currently, catch and release regulations are in effect for Arctic grayling in rivers in Montana and sections of the Big Hole River are closed to angling under specific low streamflow and high temperature thresholds. The effect of cumulative mortality from repeated catch-and-release hooking of grayling is unknown, but a potential risk given the high catchability of the species.

## *3. Disease, Competition, or Predation.*

The Service has no data to indicate that any diseases or parasites are limiting the population.

Predation and/or competition with nonnative trout is thought to limit fluvial Arctic grayling in some situations (Kaya 1992a,b). Nonnative brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), and brown trout (*Salmo trutta*) are well established with locally abundant populations throughout the upper Missouri River drainage including the Big Hole River. Research on competition between grayling and nonnative brook trout found little evidence that brook trout negatively affected microhabitat use or growth of juvenile (age 1) hatchery reared and wild Arctic grayling (Byorth and Magee 1998). However, further studies are necessary to determine whether competition or predation occur at other life stages or with brown trout or rainbow trout. Grayling apparently have particular difficulty coexisting with brown trout (e.g., Kaya 2000). Overall, the decline of grayling in the upper Missouri River coinciding with encroachment by nonnative trout (Vincent 1962; Kaya 1990, 1992a, 2000), and the difficulty in reestablishing grayling populations where nonnatives are present (Kaya 1992b) provide circumstantial evidence of competitive and/or predatory impacts from nonnative trout, and especially brown trout, in the Big Hole River.

The Service has no data to indicate that avian and mammalian predators are limiting fluvial Arctic grayling populations in the Big Hole River.

## *4. The Inadequacy of Existing Regulatory Mechanisms.*

There are no specific Federal regulatory mechanisms currently in place to protect fluvial Arctic grayling in the Big Hole River. The MFWP instituted catch-and-release angling

restrictions for fluvial Arctic grayling, and also have a policy to suspend recreational angling under drought conditions.

#### *5. Other Natural or Manmade Factors Affecting Its Continued Existence.*

Drought is a significant threat to the well being of fluvial Arctic grayling populations in the upper Missouri River basin. Southwestern Montana has experienced a severe drought since 1999 which has exacerbated the impacts of water withdrawals in the upper Missouri and Big Hole River basin. Reductions in populations of fluvial Arctic grayling and nonnative trout in the Big Hole River appear to coincide with periods of drought (Magee and Lamothe 2003, 2004).

Climate change (global warming) is predicted to result in habitat loss and fragmentation for salmonid species in the Rocky Mountains (Keleher and Rahel 1996), and should place further thermal constraints on grayling in the Big Hole River (Lohr et al. 1996) if other habitat conditions do not improve.

Fluvial Arctic grayling in the Big Hole River are possibly subject to environmental and genetic problems that threaten many small populations that generally increase the risk of extirpation.

### IV. EFFECTS OF THE ACTION

#### A. Factors to be considered

The purpose of the proposed action is to implement conservation measures that will improve habitat for Arctic grayling in the upper Big Hole River, and lead to increased abundance and distribution of the species. The CCAA is designed to alleviate non-Federal landowner concerns about land management and regulatory restrictions that may apply should the grayling be listed, and to develop working partnerships that will benefit conservation efforts.

The CCAA is designed to provide a net conservation benefit for the fluvial Arctic grayling, but there may be certain conservation actions that result in temporary disturbance to grayling habitat and/or affect the survival, growth and reproduction of individual grayling.

#### B. Analyses of effects of the Action

The following conservation measures may be implemented by the agencies and non-Federal landowners in the Big Hole River watershed to protect and enhance fluvial Arctic grayling habitat and increase the abundance and distribution of the species:



- Increasing instream flows by: (1) regulation of irrigation withdrawals via compliance with claimed water rights, (2) supplemental flow agreements where landowners reduce irrigation diversions based on certain streamflow thresholds, (3) replacing or repairing irrigation headgates and irrigation diversion structures to improve control over water diversion and delivery, (5) improving irrigation ditches by lining or another modification to reduce water losses and increase system efficiency, (6) construction of new or replacement irrigation ditches, (7) install piping to increase irrigation system efficiency (8) land leveling or smoothing to improve irrigation water distribution and increase system efficiency, (9) construct groundwater wells, (10) installing and maintaining off-stream livestock watering facilities; (11) investigating and using alternative less water intensive livestock forage that will reduce water demand for ranching operations.
- Conserving and restoring riparian habitats by: (1) passive restoration techniques that reduce livestock impacts such as prescribed grazing, rotational grazing and livestock exclusion by fences; (2) active riparian restoration by replanting natural channel bank vegetation including willows and herbaceous plants; and (3) active channel restoration including the excavation of pools, stabilization of banks, and reconfiguration of natural channel geometry (i.e., meandering channel, decreasing width:depth ratios).
- Providing fish passage throughout stream and river habitat by: (1) installing fish ladders on existing diversion structures, (2) re-designing or installing diversion structures that provide fish passage, and 3) removing of anthropogenic (culverts, road crossings, other structures) or natural barriers (beaver dams) as necessary.
- Reducing any population-level impacts from inadvertent capture in irrigation ditches (entrainment) by: (1) rescuing any fluvial Arctic grayling encountered in irrigation ditches, (2) reducing irrigation diversion volume and timing of withdrawals to reduce the likelihood of entrainment, (3) re-designing or installing irrigation diversions and flow regulation structures that reduce the likelihood of entrainment, and (4) installing fish screens on irrigation diversion structures.
- Reducing stream nutrient loading by: (1) implementing more efficient fertilizer application on pasture and hayfields, (2) relocating livestock pens in or adjacent to stream habitats, and (3) transferring livestock manure away from riparian zones.
- Monitoring the effectiveness of habitat improvement projects and biological response of fluvial Arctic grayling. Translocation of fertilized Arctic grayling eggs and/or release of individuals within the watershed to facilitate recovery where natural recolonization is not occurring.

*Direct Effects* – The above conservation measures may have direct effects on fluvial Arctic grayling and the activities causing these effects can be generally grouped into two categories: (a) activities relating to land and water use (i.e., irrigation of hay, pasture;

livestock grazing; and livestock watering) that are permitted under the CCAA at levels lower than described in the current environmental baseline, and (b) restoration and monitoring activities required by the CCAA that may cause some disturbance and harm to individual grayling or habitat.

Conservation measures will be implemented throughout the action area over a 20 year period (i.e., permit duration) and may occur both in proximity to (when the action is adjacent to stream habitat) or distant from (when action is in upland habitat) the species. Conservation measures and activities having direct effects will generally occur during the period when the river is free from ice cover and during the agricultural growing season, generally April-November. Thus, any direct effects would be expected during the spawning and rearing season of fluvial Arctic grayling, but not during overwintering.

Most disturbances resulting from conservation measures or implementation of restoration projects will involve short-term adverse impacts (Table 4). A typical example would be installation of a new irrigation headgate that would result in a short-term temporary increase in sediment input and mechanical disturbance of substrates that may affect the behavior of grayling for some distance downstream from the disturbance. Larger disturbances may result where severely degraded stream habitat necessitates active channel restoration projects in order to provide net conservation benefits to grayling.

**Table 4.** Categorization of CCAA conservation activities in terms of their anticipated net effect on Arctic grayling. Ground-disturbing activities were judged to negatively impact (take) Arctic grayling only if they directly affect grayling or its habitat, primarily through the activity's proximity to stream habitat or riparian zones. Ground-disturbing activities distant from stream habitat or riparian zones may not necessarily result in take (e.g., installing groundwater wells). Some activities may have no effect or small-scale impacts depending on site-specific conditions, so may span two columns in the table. For activities anticipated to cause some level of take (harm, harass or kill) the mode of take is listed in parentheses (sediment, habitat quality, mortality, etc.).

<b>Beneficial, no anticipated take</b>	<b>Short-term small-scale impacts, immediate benefits</b>	<b>Larger-scale or long-term impacts, long-term benefits</b>	<b>Chronic impact but magnitude reduced by CCAA or impact unavoidable or necessary</b>
Water rights compliance	Replacing/repairing irrigation headgates and irrigation diversions (sediment)	Active riparian zone restoration (sediment)	Irrigation withdrawals (reduced habitat quality)
Supplemental flow agreements	Installing fish ladders (sediment)	Channel restoration (sediment, mechanical harm)	Grazing (sediment)
Construct groundwater wells	Installing livestock exclusion fences (sediment)	Land leveling or smoothing to improve irrigation water distribution (sediment)	Entrainment (mortality)
Installing and maintaining off-stream livestock watering facilities	Removing fish-passage barriers (sediment)		Biological monitoring (stress, mortality)
Alternative livestock forage	Installing fish screens (sediment)		
Prescribed and rotational grazing	Grayling translocation (mortality)		
Reducing fertilizer application on pasture and hayfields			
Rescue of grayling entrained in ditches (handling stress)			
Ditch lining (sediment)			
New or replacement irrigation ditches (sediment)			
Relocating livestock pens and transferring manure away from riparian zone (sediment)			

The CCAA permits activities such as irrigation and livestock grazing believed to contribute to the decline in Arctic grayling. These activities will continue during the 20-year term of the permit, but at levels substantially reduced from those that have resulted in the current environmental baseline. Thus, Arctic grayling may continue to be affected by irrigation water diversions where such diversion reduce the quality and quantity of grayling habitat or entrain individuals in ditches, or through occasional livestock grazing in or impacts to riparian habitats that are permitted under the CCAA or a site-specific plan. However, the level of impacts under the CCAA will be much less compared to past and existing conditions.

Biological monitoring of the grayling population will require periodic (annual) handling of some proportion of the population. The actual percentage of the grayling population handled in any given year is low under the proposed monitoring methods, but individuals may be repeatedly captured through time.

The level of take resulting from activities relating to land and water use is unknown but should be significantly reduced if the proposed CCAA is implemented fully across the entire action area. The level of take resulting from restoration activities, general implementation of conservation measures, and monitoring activities is unknown but is expected to be low because they are specifically being implemented to benefit grayling and involve mostly minor, if any, short term disturbance (Table 4).

*Indirect effects* – Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. The CCAA is designed to improve aquatic habitats and benefit fluvial Arctic grayling but is expected to also have beneficial effects for other fishes, including nonnative trout. The presence of nonnative trout species, especially brown trout, is considered a threat to fluvial Arctic grayling in the Big Hole River. Uncertainty exists as to whether competition and predation by nonnative trout species are currently limiting the grayling population in the action area. The extent and magnitude of acute and chronic habitat degradation in the Big Hole River suggests that abiotic factors may be limiting the Arctic grayling population to a greater extent than competitive or predatory (biotic) interactions, though these factors can interact.

The CCAA will likely reduce or alleviate abiotic conditions (dewatering, thermal loading, etc.) that affect both native and nonnative fish species in the action area, thus both Arctic grayling and nonnative trout populations should respond by increasing their abundance and distribution. Thus biotic interactions with nonnative trout may play a more significant role in population regulation of the Arctic grayling under expected future conditions if the effect of increased habitat capacity or complexity does not mediate any competitive or predatory effects.

The potential level of take associated with indirect effects resulting from an increase in nonnative trout is unknown. If such take occurs only after Arctic grayling abundance and distribution has increased from CCAA-related habitat improvements, the effect may be comparatively minor at the population level (i.e., more individuals may be affected, but

the overall population is larger so the overall impact on persistence of the population is negligible). However, if Arctic grayling are currently limited by biotic interactions with nonnative trout, then implementation of the CCAA may result in more immediate and significant effects through increased per-capita levels of competition and predation.

The CCAA requires monitoring of nonnative trout populations in conjunction with Arctic grayling, and that these data be evaluated by an expert technical review committee whose responsibility is to assess the threat of nonnative trout to grayling and provide written recommendations to the Agencies implementing the CCAA. Thus, the relative risk to grayling posed by nonnative trout should be tracked through time and may lead to management interventions such that the indirect effects discussed above may not occur or their impact reduced.

*Interrelated and interdependent actions* - Effects of the action under consultation are analyzed together with the effects of other activities that are interrelated to, or interdependent with, that action. An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. No activities or other actions are known to be interrelated or interdependent to the proposed action.

### C. Species Response to the Proposed Action

The overall outcome of the proposed action will be a net benefit for grayling terms of improved habitat conditions. The anticipated response of Arctic grayling to the proposed action is an increase in their abundance and distribution in the upper Big Hole River. Many of the actions required under the CCAA are expected to have entirely positive effects for Arctic grayling (Table 4, left-hand column).

A number of conservation measures that will have both immediate and long-term benefits for Arctic grayling require some level of disturbance in order to be implemented (e.g., Table 4, middle two columns). Take resulting from these disturbances is anticipated to be minor relative to the benefits. For example, ground disturbance associated with installation of a new headgate may result in a short-term pulse of sediment that may temporarily affect the behavior and growth of Arctic grayling present near the site. However, the effect of replacing the headgate will be a more efficient irrigation system (e.g., no leaking) and therefore more water available for instream flows over a 20-year period. Similarly, installation of a fish screen may result in a pulse of sediment, but operation of the screen may keep numerous grayling from being entrained in irrigation ditches and lost to the population.

More active restoration methods such as channel restoration, if required, may result in disturbances of greater intensity and magnitude (see Table 4). Reduced growth and direct mortality of grayling could occur from sediment inputs or mechanical effects. However, such take should be counter-acted by subsequent increases in growth, survival,

reproduction and an increase in habitat carrying capacity that would result from restoring riparian habitats, fluvial processes of erosion and deposition, and channel geometry.

Agriculture and ranching activities permitted by the proposed CCAA will result in chronic impacts to Arctic grayling, though the magnitude of these impacts will be reduced compared to the environmental baseline. Irrigation withdrawals can reduce instream flows, increase water temperatures, and produce habitat fragmentation, which reduces the growth, reproduction and survival of grayling. The proposed CCAA will reduce these negative effects because it will help private landowners use less water for agricultural and ranching purposes. Livestock grazing will continue to be a major activity in the action area over the duration of the Permit, but the implementation of prescribed grazing and livestock exclusion fencing is anticipated to reduce livestock impacts to riparian zones. Consequently, sedimentation, nutrient input, and browsing of willows associated with current grazing practices should be greatly reduced, so any existing levels of take associated with livestock grazing would correspondingly decline.

Entrainment of Arctic grayling in irrigation ditches will continue at some unknown level, but the population-level effects of mortality from entrainment will be reduced under the CCAA by the installation of fish screens or other measures to reduce the probability of entrainment.

Arctic grayling will be directly handled by fishery professionals for the purposes of monitoring the population. Monitoring is a CCAA requirement. Electrofishing, capture and handling may result in physiological stress and possibly mortality of individual grayling. These effects should be minor at the population level in any given year because the CCAA's monitoring activities appear to be dependent on the population's perceived ability to tolerate handling and capture relative to current population levels and environmental conditions. The methods used in monitoring (electrofishing) may result in only a proportion of the population being captured in any given year. The effect of long-term population monitoring on fluvial Arctic grayling in the Big Hole River unknown, but the Service does not have any data indicating past monitoring has contributed to the current environmental baseline.

Competition and predation by nonnative trout may reduce the growth and survival of Arctic grayling if implementation of the CCAA indirectly leads to an increase in nonnative trout abundance and distribution. The effect of this take is unknown. If the grayling population responds positively to improved habitat conditions as anticipated, then the population-level effects of take (from nonnative trout) may be negligible if the grayling population is buffered by its increased resilience.

Overall, the net positive benefits of the proposed action appear to outweigh the mostly short-term impacts associated with implementing the CCAA and the chronic effects that would continue, but at reduced magnitude and intensity, under the CCAA. The magnitude and extent of benefits from the CCAA will depend on amount, distribution and condition of non-Federal lands actually enrolled in the CCAA.

#### IV. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this conference opinion. Future Federal actions that are unrelated to the proposed issuance of the section 10(a)(1)(A) Enhancement of Survival Permit are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Past and present agricultural and ranching activities, primarily irrigated agriculture for hay production, pasture and livestock grazing, have degraded and fragmented aquatic and riparian habitats in the Big Hole River watershed and are implicated in the decline of fluvial Arctic grayling. Under the CCAA, these land and water use activities on enrolled lands would be modified so their negative effects on Arctic grayling would be reduced or eliminated. However, past land and water use practices conducted in accordance with applicable laws may continue on *unenrolled* non-Federal lands within the action area. If no alternative (non-CCAA) conservation measures were implemented on these unenrolled lands, then impacts to grayling may continue. Similarly, the beneficial effects to grayling from increased streamflows resulting from actions on CCAA-enrolled lands may be counteracted by otherwise-legal irrigation withdrawals by unenrolled landowners.

The extent to which actions on unenrolled lands may continue to negatively affect grayling or limit the effectiveness of the CCAA is unknown, but mitigated by two factors. First, while actual participation in the proposed CCAA is unknown, landowners representing over 60% of the project area have already expressed to MFWP (in writing) their willingness to participate in the CCAA, if executed by the Service. Second, the CCAA includes a strategy involving change of use for water rights to help ensure that water "saved" under the CCAA remains in the river for beneficial instream uses.

If landowners not enrolled under the CCAA work cooperatively with the agencies to develop and implement similar conservation measures as those implemented under the CCAA, threats to the fluvial Arctic grayling would be further reduced. Any such projects with a Federal nexus (permitted or authorized) outside of the CCAA would undergo separate section 7 consultation, if necessary.

Translocation of fluvial Arctic grayling to waters within the action area may occur at some time in the future if the grayling population does not respond to the CCAA habitat improvements as expected. These translocation activities would need to be authorized through a separate permit if the fluvial Arctic grayling is listed.

#### V. CONCLUSION

After reviewing the current status of the upper Missouri River distinct population segment of fluvial Arctic grayling, the environmental baseline for the action area in the upper Big Hole River (Montana), the effects of the proposed umbrella CCAA and the cumulative effects, it is the Service's conference opinion that execution of the CCAA and

issuance of the Enhancement of Survival Permit, as proposed, is not expected to reduce appreciably the likelihood of both the survival and recovery of fluvial Arctic grayling in the wild by reducing the reproduction, numbers, or distribution of that species. Thus, we conclude that the proposed action is not likely to jeopardize the continued existence of the species.

We base this conclusion on the judgment that the proposed action will have a net positive impact on Arctic grayling populations and habitat in the action area because:

- Implementation of the CCAA is expected to lead to a suite of actions with immediate and direct beneficial effects to Arctic grayling
- Adverse impacts associated with implementation of conservation measures under the CCAA are expected to be minor, and should be offset and exceeded by beneficial and long-lasting effects to Arctic grayling and its habitat
- The level of adverse impacts from past and present land and water use activities, especially irrigation and livestock grazing, will be reduced from implementation of site-specific plans such that the environmental baseline will be improved
- Collectively, the CCAA addresses major habitat-related threats to Arctic grayling in the Big Hole River and is likely lead to increased distribution and abundance of the species in the action area
- Future indirect effects from nonnative trout will be monitored by the Agencies

No critical habitat has been designated for this species; therefore, none will be affected.

## VI. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.



The proposed umbrella CCAA identifies the conservation measures that will be implemented to benefit fluvial Arctic grayling. All conservation measures described in the CCAA, are hereby incorporated by reference as Reasonable and Prudent Measures and Terms and Conditions within the Incidental Take Statement pursuant to 50 CFR§402.14(i). The measures described below are non-discretionary, and must be undertaken by the Service so that they become binding conditions of any grant or permit issued to the Service, as appropriate, for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the MFWP to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the MFWP must report the progress of the action and its impact on the species to the Service as specified in the CCAA and the incidental take statement. [50 CFR §402.14(i)(3)]. The prohibitions in section 9 of the ESA against taking the species do not apply until the species is listed.

#### A. Amount or extent of take anticipated

The Service anticipates take of fluvial Arctic grayling will result from implementation of the CCAA throughout the action area.

Incidental take is expected to result from agricultural and ranching activities conducted at levels specified in the proposed action and in accordance with applicable local, State and Federal laws. Take in the form of harm or mortality is anticipated from irrigation and stock water withdrawals that reduce the quality and quantity of grayling habitat, entrainment in irrigation ditches, livestock grazing in riparian zones, and operation of diversion structures that affect fish passage (Montana Fish, Wildlife and Parks et al. 2006, pp. 79-80, 124-125). Incidental take is also expected from habitat restoration and monitoring activities necessary to implement the CCAA. Take in the form of harm or mortality may result temporary disturbance incidental to habitat improvement projects and replacement or installation of irrigation infrastructure (headgates, fish ladders, fish screens, etc.) required to benefit grayling. Take in the form of harm or mortality may result from population monitoring of grayling, and (if necessary), and translocation projects (Montana Fish, Wildlife and Parks et al. 2006, pp. 79-81, 124-125). Some negligible disturbance is also possible from habitat monitoring.

The MFWP and landowners enrolled in the CCAA through a valid Certificate of Inclusion are exempted from incidental take of fluvial Arctic grayling, if and when the species is listed under the ESA. Take is exempted to the extent that take of this species would otherwise be prohibited under section 9 of the ESA and its implementing regulations, or pursuant to a rule promulgated under section 4(d) of the ESA. Take must be incidental to otherwise lawful activities on enrolled lands in the action area and be

consistent with implementation of the CCAA and a participating landowner's Certificate of Inclusion.

The amount or extent of take anticipated under the CCAA is difficult to quantify. The proposed action is a programmatic agreement over a 380,000 acre area that includes over 80 miles of stream habitat. The CCAA requires a suite of activities and conservation measures that may or may not be implemented depending on site-specific conditions. Lack of data, most notably on the amount of irrigation water historically diverted by landowners in the action area, imparts a significant element of uncertainty on any credible estimate of current or projected absolute levels of incidental take. The actual population size of fluvial Arctic grayling in the Big Hole River is unknown because of the technical and logistic challenges in monitoring abundance of rare but highly mobile species. Except for population monitoring where a specific number of individuals will be handled, assessing the level or extent of take in terms of number of grayling is problematic because:

- ◆ The actual finding of dead or injured individual fluvial Arctic and relating that death or injury to implementation of the CCAA is unlikely given the large size of the action area and the variety of environmental factors that influence grayling;
- ◆ Dead or impaired individuals in both natural stream channels and irrigation ditches may be washed downstream of the site where the impact occurred;
- ◆ Fish decompose very rapidly and may be consumed by scavengers;
- ◆ Natural fluctuations in species abundance may mask project effects;
- ◆ Harm in the form of reduced growth or decreased reproductive output is both difficult to quantify and hard to separate from other causes;

Take of Arctic grayling from biological monitoring by MFWP is anticipated to be no more than 15 individuals per year. The Service expects the actual amount of this take to be less because professional fishery biologists familiar with grayling will surveys, capture and handling of grayling will occur under approved protocols so that injury and stress are minimized, and monitoring will be reduced or suspended monitoring surveys when environmental conditions are stressful for coldwater fishes (Montana Fish, Wildlife and Parks et al. 2006).

Take of Arctic grayling from all other CCAA-related actions, including agriculture, ranching, implementation of conservation measures and habitat restoration will require a surrogate measure. This surrogate measure will be full adherence and compliance with site-specific plans and the requirements of the umbrella CCAA. That is, the amount of incidental take exempted is that which occurs when participating landowners, MFWP and the cooperating agencies are implementing Service-approved site-specific plans that are designed to reduce threats to Arctic grayling in enrolled land. By extension, any non-

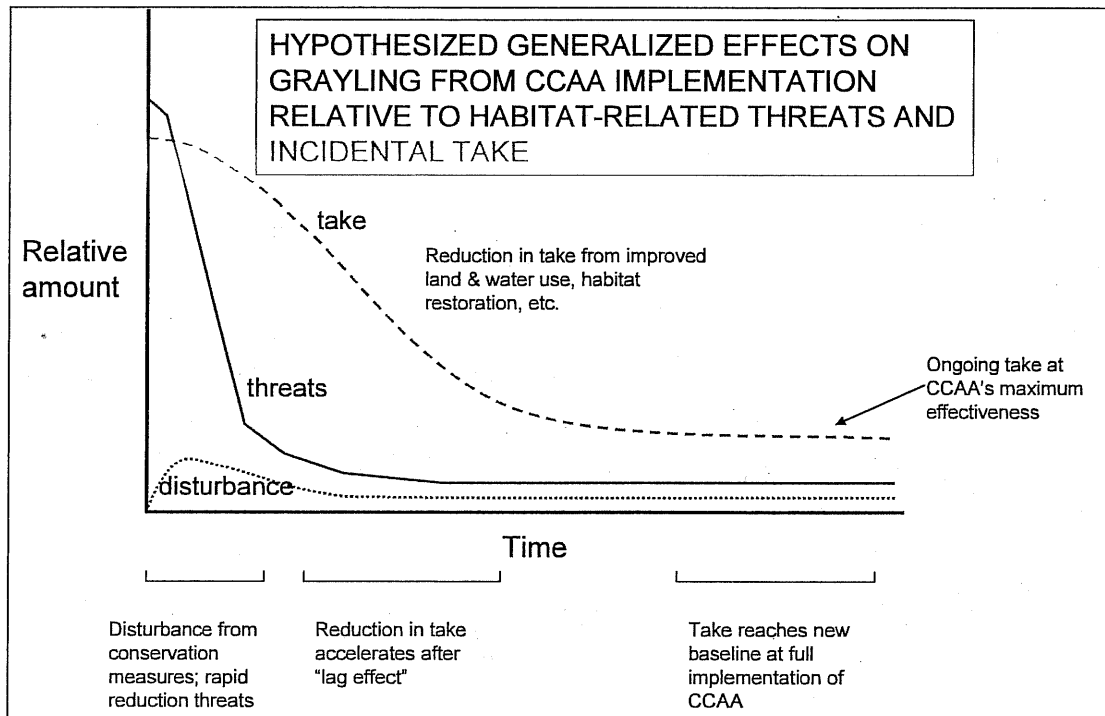
compliance with the site-specific plans or the CCAA may mean the level of exempted take has been exceeded and the protective coverage of section 7(o)(2) may lapse.

The level of incidental take of grayling from agriculture, ranching, implementation of conservation measures and habitat restoration will be minimized by a number of factors. First, the CCAA itself is a minimizing factor for take from traditional land and water use in the action area (i.e., agriculture and ranching). These activities will continue under the CCAA, but the intensity, severity, and magnitude of their effects will be reduced such that take will be correspondingly reduced. Second, conservation measures or restoration projects that require ground disturbance will be implemented recognizing current environmental conditions and the life cycle of grayling in the action area so that potential impacts are minimized. For example, effects will be minimized by utilizing expert personnel wherever conservation measures require construction or ground-disturbing activities, and by scheduling the work when streamflow and environmental conditions are suitable to reduce site impacts and sediment input (Montana Fish, Wildlife and Parks et al. 2006).

The actual or absolute levels of incidental take that will occur under the proposed CCAA are difficult to quantify given the best available commercial and scientific data. We have attempted to describe, in relative terms, how the amount or extent of take is anticipated to change through time under the CCAA using the following assumptions:

- Full implementation of the CCAA across the action area and enrollment of all 380,000+ acres of non-Federal lands because this would theoretically result in the greatest amount of take potentially exempted by the Permit
- Full compliance by all parties with site-specific plans and the umbrella CCAA
- General implementation of the CCAA and site-specific plans according to the schedule in the proposed action (Montana Fish, Wildlife and Parks et al. 2006, pp. 62-66),
- The timeline for implementing specific conservation measures and the anticipated reduction in specific threats according to the proposed action (*ibid*, pg. 61),
- The anticipated impacts to Arctic grayling from covered (take exempt) activities (*ibid*, pp.79-81).
- Habitat and environmental conditions are the most significant factors regulating or limiting the grayling population in the Big Hole River

The anticipated generalized effect of the CCAA on incidental take through time is provided in Figure 1.



**Figure 1.** Hypothesized generalized effect of the CCAA on incidental take of grayling in relation to habitat-related threats resulting from past and ongoing land and water use practices, and conservation- and restoration-related disturbance. Time axis begins at present. Threats are defined as factors causing adverse impacts to grayling. See text for a thorough description.

*Disturbance for conservation and habitat restoration* – The relative amount of short-term ground disturbance is expected to be highest in the first few years of CCAA implementation because numerous physical structures will be replaced or installed (e.g., headgates, fish ladders, fish screens, etc.), and active restoration projects may be required for severely degraded riparian habitats or stream channels. This type of disturbance is expected to drop to low (baseline) levels characteristic of maintenance and monitoring of existing structures or projects.

*Threats (factors causing adverse impacts to grayling)* – Implementation of conservation measures that provide immediate improvements to instream flows, such as water rights compliance and installation of properly functioning headgates; provide passage to migrating grayling; and stop overgrazing and degradation of riparian zones is anticipated to result in an immediate reduction in threats (and adverse impacts) grayling. The rate of threat reduction will slow over time, because some factors, such as habitat simplification, channel modification and thermal loading will take longer to address or the solutions will take longer to implement. Threats (and adverse impacts) do not go to zero because land

use practices, such as irrigation and livestock grazing, will continue though the magnitude of these threats and their impacts are reduced from initial levels.

*Incidental take* – The “relative amount of take” represents presumed population-level effect of take. Habitat-related threats are currently widespread and imminent, and presumably affect most of the grayling present in the Big Hole River at least occasionally. The population is currently at low abundance, so the present (pre-CCAA) relative level of incidental take is high.

Relative take is presumed to decline slowly at first as easily addressed threats are remedied. The threats and take curves do not match, however because there is anticipated to be a lag between when actual threats are removed and when the physical habitat and the grayling population responds. For example, the threat associated with livestock grazing may be quickly removed if cows are excluded from riparian zones by installing fences. Actual recovery of the riparian zone, which involves vegetative response and stream channel adjustment, will take longer so the time for grayling to respond (through improved growth, survival, reproductive output, etc.) and may lag behind actual removal of the threat causing the adverse impact.

At some point in the future, relative take is expected to decline substantially as the habitat template of the system returns to more normal conditions because properly functioning riparian zones will be present, streamflows will be consistently higher through the cumulative effects of irrigation system improvements and better land management, stream channel width:depth ratios decline by channel adjustment, reduced entrainment, etc. Further in the future, a new lower baseline of relative take is expected to be established. Take will not be reduced to zero because of ongoing land and water use activities. The relative level of take is anticipated to be significantly reduced compared to pre-CCAA conditions because the magnitude and intensity of the adverse impacts have been reduced and the grayling population has increased.

The anticipated effects described above presume that habitat conditions, and not nonnative trout, are limiting Arctic grayling. If this assumption is incorrect and if the CCAA indirectly increases abundance of nonnative trout such that competition and predation begins to affect Arctic grayling, then the “threat” and “take” curves in Figure 1 would begin to rise. The Service anticipates that because of the species’ high fecundity and growth rate, Arctic grayling would likely respond quickly to improved habitat conditions (and thus increase their abundance) before competitive or predatory effects resulted in increased take.

#### B. Effect of the take

The accompanying conference opinion has determined that the level of anticipated take under the CCAA is not likely to result in jeopardy to fluvial Arctic grayling. Overall, the expected effect of the CCAA will be a reduction in incidental take over an area that encompasses most of the occupied habitat for the species in the river system and a net benefit to the species relative to the current environmental baseline. Thus, the effect of

the take will be secondary to an action which is anticipated to promote conservation of the species.

### **C. Reasonable and Prudent Measures**

The Service believes the following Reasonable and Prudent Measures are necessary and appropriate to minimize the impacts of incidental take to the fluvial Arctic grayling.

**RPM1.** The proposed umbrella CCAA identifies the conservation measures that will be implemented to benefit fluvial Arctic grayling. All conservation measures described in the CCAA, together with any terms and conditions described in the Permit issued for the CCAA, are hereby incorporated by reference as Reasonable and Prudent Measures within the Incidental Take Statement pursuant to 50 CFR§402.14(i).

**RPM2.** The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the MFWP to adhere to the terms and conditions of the incidental take statement the protective coverage of section 7(o)(2) may lapse

### **D. Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the Act, the MFWP and Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary. Failure to adhere to the terms and conditions may result in a lapse of protective coverage provided by the Permit and section 7(o)(2).

**T&C1.** The MFWP will work with the non-Federal landowners and the Service to fully execute and implement the conservation measures identified in the CCAA. This includes the requirements for monitoring and reporting described in the CCAA.

**T&C2.** The Service will fulfill their regulatory oversight role described in the CCAA and in this incidental take statement.

### **E. Reporting Requirements**

The CCAA (and T&C1) requires the MFWP to provide an annual report by February 1 of each year (per the CCAA) that includes: 1) a summary of Certificates of Inclusion issued and site specific plans approved over the past year; 2) a summary of the grayling

entrainment surveys and rescue efforts, 3) a summary of the estimated take from the implementation of conservation measures, monitoring activities, and any other take obviously resulting from land and water use related to the CCAA's covered activities; 4) a summary of projects related to the conservation measures described in the CCAA; 5) the results of completed biological, habitat project performance and compliance monitoring; 6) recommendations for future management activities consistent with the Agreement; and 7) a summary of enforcement actions associated with landowner compliance with site-specific plans.

In addition, upon locating any dead fluvial Arctic grayling in the project area, the FWP will, within 14 days, notify the Service's Montana Field Office of the number and disposition of specimens. The Service recommends that dead specimens be preserved or retained by MFWP for future analysis.

Any correspondence or reports related to the Permit, the CCAA, or the incidental take statement should be directed to: Mark Wilson, Montana Field Supervisor, US Fish and Wildlife Service, 585 Shepard Way, Helena, Montana 59601.

#### F. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The MFWP and Service should work with other Federal agencies, and county, city, or other local governments to: (a) ensure measures implemented through the CCAA also are implemented on non-enrolled lands in the Big Hole River watershed, (b) continue efforts to re-establish additional fluvial Arctic grayling populations in historic waters outside of the Big Hole River drainage, (c) gather more information on the population status of Arctic grayling in the Madison River-Ennis Reservoir.

#### G. Reinitiation-Closing Statement

This concludes the conference for the potential effects of the approval of the CCAA and issuance of the Permit on upper Missouri River DPS of fluvial Arctic grayling. The MFWP may ask that this conference opinion be confirmed as a biological opinion issued through formal consultation if the fluvial Arctic grayling is listed. The request must be in writing. During review of the proposed action if the Service finds that there have been no significant changes in the CCAA as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing the fluvial Arctic grayling, should that occur, and any subsequent adoption of this conference opinion, reinitiation of consultation will occur if--(1) the amount or

extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action (50 CFR §402.16). In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The incidental take statement provided in this conference opinion does not become effective until/if the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of fluvial Arctic grayling has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of fluvial Arctic grayling may occur between the listing of fluvial Arctic grayling, should that occur, and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

Should you have any questions regarding this conference opinion, please contact Doug Peterson at 406-449-5225.



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## **EXHIBIT E**



**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****Environmental Assessment and Receipt of an Application for a Permit To Enhance the Survival of the Fluvial Arctic Grayling in the Upper Big Hole River in Southwestern Montana Through an Umbrella Candidate Conservation Agreement With Assurances**

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of availability and receipt of application.

**SUMMARY:** Montana Fish, Wildlife and Parks (FWP) has applied to the Fish and Wildlife Service (Service) for an Enhancement of Survival Permit for the fluvial Arctic grayling (*Thymallus arcticus*) pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (ESA). The permit application includes a proposed Umbrella Candidate Conservation Agreement with Assurances (Agreement) between the FWP and the Service. The USDA Natural Resources Conservation Service (NRCS) and Montana Department of Natural Resources and Conservation (DNRC) also are signatories for the proposed Agreement. The Agreement, the permit application, and the Environmental Assessment are made available for public comment by this notice.

The purpose of the Agreement is for private landowners and the FWP, NRCS, DNRC, and the Service to implement conservation measures for the fluvial Arctic grayling in the upper Big Hole River in southwestern Montana. The effort is in support of the FWP's ongoing efforts to enhance the abundance and distribution of the fluvial Arctic grayling throughout its historic range in the upper Missouri River basin. The conservation measures would be implemented by FWP, NRCS, DNRC, the Service, and by participating landowners. A technical working group comprised of FWP, NRCS, DNRC, and the Service developed the conservation measures for the proposed Agreement. Consistent with the Service's Candidate Conservation Agreement with Assurances Final Policy (CCAA Policy) (64 FR 32726, June 17, 1999), the Agreement is intended to facilitate the conservation of fluvial Arctic grayling by giving the State of Montana and cooperating private landowners incentives to implement conservation measures. Participating Landowners would receive regulatory certainty concerning land and water use

restrictions that might otherwise apply should the fluvial Arctic grayling become listed under the ESA. Participating Landowners with eligible property in the upper Big Hole River watershed in southwestern Montana could sign up under the Agreement and the associated permit through site-specific plans for their property and a Certificate of Inclusion. The proposed term of the Agreement and the permit is 20 years.

The Service and FWP have prepared a joint Environmental Assessment for execution of the Agreement and issuance of the permit pursuant to the National Environmental Policy Act (for the Service) and implementation of the Agreement pursuant to the Montana Environmental Policy Act (for FWP). The environmental assessment considers the biological, environmental, and socioeconomic effects of the proposed Agreement and permit. The assessment also evaluates two alternatives to the Agreement and permit, and their potential impacts on the environment.

We request comments from the public on the permit application, draft Agreement, and draft Environmental Assessment. All comments we receive, including names and addresses, will become part of the administrative record and may be released to the public.

**DATES:** Written comments on the permit application must be received on or before January 23, 2006.

**ADDRESSES:** Written data or comments concerning the permit application, the draft Agreement, or the draft Environmental Assessment are to be submitted to Arctic Grayling CCAA, U.S. Fish and Wildlife Service, 100 North Park Avenue, Suite 320, Helena, Montana 59601. Written comments also may be provided electronically to [fw6\\_arcticgrayling@fws.gov](mailto:fw6_arcticgrayling@fws.gov), or by facsimile to 406-449-5339. Comments must be submitted in writing to be considered in the Service's decision-making process.

**FOR FURTHER INFORMATION CONTACT:** Mark Wilson or Douglas Peterson at the above address, or telephone 406-449-5225.

**SUPPLEMENTARY INFORMATION:****Document Availability**

Persons wishing to review the permit application, Agreement, and the Environmental Assessment may obtain a copy by writing the Service's Montana Ecological Services office at the above address, or contacting the above office by telephone, electronic mail, or facsimile. You also may make an appointment to view the documents at

the above address during normal business hours. The documents also are available electronically on the World Wide Web at <http://mountain-prairie.fws.gov/species/fish/grayling/grayling.htm>.

**Background**

Under a Candidate Conservation Agreement with Assurances, participating landowners voluntarily implement conservation activities on their properties to benefit species that are proposed for listing under the ESA, candidate species, or other sensitive species. Candidate Conservation Agreements with Assurances encourage private and other non-Federal property owners to implement conservation efforts and reduce threats to unlisted species by assuring them they will not be subjected to increased property-use restrictions if the species is listed in the future under the ESA. Application requirements and issuance criteria for enhancement of survival permits through CCAs are found in 50 CFR 17.22(d) and 17.32(d).

On July 25, 1994, the Service found that listing the fluvial Arctic grayling of the upper Missouri River Distinct Population Segment (DPS) was warranted but precluded by higher priority listing actions, and it has remained on the Service's candidate species list since that time. Fluvial Arctic grayling currently occupy only about 5 percent of their historic range in the Missouri River basin above the Great Falls, and the remaining population is found in an approximately 129-kilometer (80-mile) segment of the upper Big Hole River in southwestern Montana. The fluvial Arctic grayling population in the Big Hole River has declined in abundance and distribution in recent years, and ongoing efforts by FWP to re-establish additional fluvial Arctic grayling in other rivers within its historic range have not yet produced any self-sustaining populations. This DPS remains at risk, and FWP and the Service carefully monitor the status of the species.

The Montana Fluvial Arctic Grayling Workgroup's 1995 Montana Fluvial Arctic Grayling Restoration Plan and the Service's 2004 Candidate Notice of Review have identified threats that contribute to the current and future status of the species. These include—habitat loss, fragmentation, and degradation caused by hydrologic alterations and stream dewatering from irrigation withdrawals, thermal loading, loss of riparian habitat, and cross-channel irrigation diversion structures; drought; entrainment in irrigation ditches; and encroachment by nonnative

trout species. Most of the current and historic fluvial Arctic grayling habitat in the Big Hole River watershed is on or adjacent to private lands. The decline of fluvial Arctic grayling in the system has been attributed in part to agricultural activities on these lands, so the active involvement of private landowners in conservation efforts is viewed as critical to the preservation of the species.

Consequently, FWP has developed an Agreement for the fluvial Arctic grayling in cooperation with the NRCS, DNR, and the Service; and has applied to the Service for a permit under section 10(a)(1)(A) of the ESA (16 U.S.C. 1531 *et seq.*), which would authorize future take of the fluvial Arctic grayling by FWP and cooperating landowners if and when the species is listed. The FWP and the Service believe approval of the Agreement is necessary to promote implementation of conservation measures on non-Federal lands.

The FWP and the Service believe implementation of the Agreement will increase the distribution and abundance of fluvial Arctic grayling in the Big Hole River, and will make a significant contribution to the long-term viability of the species. Without the Agreement, FWP and the Service are concerned that the population of fluvial Arctic grayling in the Big Hole River may continue to decline. Further decline of the species will increase the risk of its extirpation. The FWP and the Service believe that implementing proactive conservation measures in cooperation with private landowners prior to any potential ESA listing will realize greater conservation benefits for the species than post-listing actions.

Under the Agreement and permit, Participating Landowners would provide certain fluvial Arctic grayling habitat protection and/or enhancement measures on their lands. Protection and enhancement measures will be directed at improving habitat conditions for all age classes of fluvial Arctic grayling primarily by increasing instream flows, conserving or restoring riparian habitats, removing or mitigating for any man-made barriers to migration, and reducing threats from entrainment in irrigation ditches. If the fluvial Arctic grayling upper Missouri River DPS is listed under the ESA, and a Participating Landowner is properly implementing the agreed-to conservation measures, the permit would authorize take of fluvial Arctic grayling that may result from the non-Federal landowner's agricultural or ranching related activities (e.g., surface-water diversion and irrigation, hay cultivation and harvesting, livestock grazing, farm equipment operation) so

long as they were being conducted according to the Agreement and the landowner's site-specific plan.

We are providing this notice pursuant to section 10(c) of the ESA and implementing regulations for the National Environmental Policy Act (40 CFR § 1506.6). We will evaluate the permit application, associated documents, and comments submitted thereon to determine whether the permit application meets the requirements of section 10(a)(1)(A) of the ESA, the Service's CCAA Policy and the National Environmental Policy Act. The Service also will evaluate whether the issuance of the permit and execution of the Agreement by the Service complies with section 7 of the ESA by conducting an intra-Service section 7 consultation on the issuance of the permit and execution of the permit. If we determine that all requirements are met, we will sign the Agreement and issue an enhancement of survival permit under section 10(a)(1)(A) of the ESA to the FWP for take of fluvial Arctic grayling incidental to otherwise lawful activities in accordance with the terms of the Agreement and the permit. We will not make our final decision until after the end of the 60-day comment period and after consideration of all comments received during the comment period.

**Authority:** The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) and the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*).

Dated: October 18, 2005.

**Sharon R. Rose,**

*Acting Regional Director, Denver, Colorado.*

[FR Doc. 05-23151 Filed 11-22-05; 8:45 am]

**BILLING CODE 4310-55-P**

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### Notice of Intent To Prepare a Comprehensive Conservation Plan and Environmental Assessment for Logan Cave National Wildlife Refuge in Benton County, AR

**AGENCY:** Fish and Wildlife Service, Interior

**ACTION:** Notice of intent.

**SUMMARY:** The Fish and Wildlife Service, Southeast Region, intends to gather information necessary to prepare a comprehensive conservation plan and environmental assessment pursuant to the National Environmental Policy Act of 1969 and its implementing regulations.

The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, requires the Service to develop a comprehensive conservation plan for each national wildlife refuge. The purpose in developing a comprehensive conservation plan is to provide refuge managers with a 15-year strategy for achieving refuge purposes and contributing toward the mission of the National Wildlife Refuge System, consistent with sound principles of fish and wildlife management, conservation, legal mandates, and Service policies. In addition to outlining broad management direction on conserving wildlife and their habitats, plans identify wildlife-dependent recreational opportunities available to the public, including opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

The purpose of this notice is to achieve the following.

- (1) Advise other agencies and the public of our intentions, and
- (2) Obtain suggestions and information on the scope of issues to include in the environmental document.

**DATES:** Special mailings, newspaper articles, and other media announcements will be used to inform the public and state and local government agencies of the opportunities for input throughout the planning process. Open house style meeting(s) will be held throughout the scoping phase of the comprehensive conservation plan development process.

**ADDRESSES:** Comments, questions, and requests for more information regarding the Logan Cave National Wildlife Refuge planning process should be sent to: Ben Mense, Refuge Manager, Logan Cave National Wildlife Refuge, 10448 Holla Bend Road, Dardanelle, Arkansas 72834; Telephone 479/229-4300; Fax: 479/229-4302; Electronic mail: [ben\\_mense@fws.gov](mailto:ben_mense@fws.gov). To ensure consideration, written comments must be received no later than January 9, 2006. Our practice is to make comments, including names and addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home addresses from the record, which we will honor to the extent allowable by law.

**SUPPLEMENTARY INFORMATION:** Logan Cave National Wildlife Refuge was established in 1989 under the Endangered Species Act of 1973. This 123-acre Ozark Mountain refuge, which



## **EXHIBIT F**



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE Mountain-Prairie Region



IN REPLY REFER TO:  
FWS/R6  
ES

MAILING ADDRESS:  
P.O. Box 25486, DFC  
Denver, Colorado 80225-0486

STREET LOCATION:  
134 Union Boulevard  
Lakewood, Colorado 80228-1807

JUN 01 2006

### Memorandum

To: Regional Director, Region 6

From: Assistant Regional Director, Fisheries and Ecological Services, Region 6 *M. J. Stempel*

Subject: Findings and Recommendations for Issuance of a Section 10(a)(1)(A) Enhancement of Survival Permit (TE104415-0) to Montana Fish, Wildlife and Parks in Association with the Umbrella Candidate Conservation Agreement with Assurances for Fluvial Arctic Grayling in the Upper Big Hole River, Montana

### I. DESCRIPTION OF THE PROPOSED ACTION

The Montana Fish, Wildlife and Parks (MFWP) has applied to the U.S. Fish and Wildlife Service (Service) for an Enhancement of Survival Permit (Permit) to authorize incidental take of fluvial Arctic grayling (*Thymallus arcticus*) within an approximate 380,000-acre project area in the upper Big Hole River watershed in Beaverhead and Deerlodge Counties, Montana. As a condition of the proposed Permit, the MFWP, Montana Department of Natural Resources and Conservation (MDNRC), USDA Natural Resources Conservation Service (NRCS), and the Service (collectively, the Agencies), shall implement a Candidate Conservation Agreement with Assurances (CCAA) (MFWP et al. 2006), that includes land and water-use activities and conservation practices that would be implemented on non-Federal lands to benefit fluvial Arctic grayling, and will include site-specific plans for each participating non-Federal landowner that specifies the activities and conservation measures to be implemented on that property. The MFWP has submitted the CCAA as part of their Permit application. The proposed 20-year Permit would be issued in accordance with section 10(a)(1)(A) of the Endangered Species Act (ESA), as amended, and the Service's CCAA final policy (64 FR 2726).

Under the CCAA, the Agencies would work with participating landowners to provide conservation benefits for fluvial Arctic grayling across the 380,000-acre project area, and waters of the Big Hole River and its tributaries adjacent to this area. The CCAA and the Permit would authorize incidental take of fluvial Arctic grayling on enrolled lands that was consistent with section 10 of the ESA. The Permit would become effective concurrent with listing, should fluvial Arctic grayling be listed under the ESA during the 20-year term of the Permit. The

Permit would authorize or exempt incidental take resulting from otherwise lawful agricultural and ranching activities in the project area including irrigation of hay and pasture, livestock grazing and livestock watering; and also authorize incidental take resulting from habitat restoration, implementation of conservation measures, and monitoring that would be necessary to benefit the fluvial Arctic grayling and determine the effectiveness of the CCAA. The Permit would include ESA regulatory assurances as discussed in the Service's CCAA final policy (64 FR 32726). These regulatory assurances would mean that participating landowners would not be required to modify their land and water-use activities, beyond that specified in the CCAA and their approved site-specific plan, should the fluvial Arctic grayling be listed under the ESA.

The CCAA is intended to reduce or eliminate habitat-related threats to fluvial Arctic grayling in the Big Hole River for a period of 20 years. The conservation goal of the CCAA is to secure and enhance the fluvial Arctic grayling population in the Big Hole River by increasing its abundance and distribution in the watershed. Improving the chances for long-term persistence for this population will promote conservation of the species by complementing the State of Montana's efforts to reestablish additional grayling populations in historic waters outside the Big Hole River. The four primary objectives of the CCAA are to improve stream flow conditions in the Big Hole River and promote adequate flows for grayling spawning, rearing and sheltering; conserve and restore riparian habitats that help create and maintain fish habitat; identify and reduce or eliminate entrainment of grayling in irrigation ditches, entrainment threats for grayling, and removing barriers that limit natural migratory behavior of grayling. Progress toward the conservation goal will be measured by MFWP's active monitoring of the grayling population and comparison with 5-year trends in abundance and 10-year distribution targets for the population.

The CCAA would be a partnership between Participating Landowners and the Agencies where the parties would implement fluvial Arctic grayling conservation measures on enrolled lands as identified in the CCAA and in their individual site-specific plans. The CCAA provides a framework for the development and implementation of the site-specific plans which involves the coordinated efforts of State and Federal agencies (i.e., MFWP, NRCS, MDNRC, and Service) with expertise in fishery biology and management; wildlife biology; hydrology; and all aspects of agricultural, irrigation, and grazing management.

Conservation measures to be implemented under the CCAA and in each Participating Landowner's comprehensive site-specific plan, as applicable, can be grouped into four general objectives (or categories) as discussed earlier--1) improving instream flows, 2) conserving or restoring riparian habitats, 3) removing barriers to fluvial Arctic grayling movement, and 4) addressing entrainment threats. Examples of specific actions under each of the general measures are listed below:

1. **Improving Instream Flows.** Specific actions include, but are not limited to--1) upgrading irrigation structures to improve control over water diversion and delivery; 2) compliance with water rights; 3) repairing leaking head gates and water diversion structures; 4) reducing irrigation withdrawals; 5) improving irrigation ditches to reduce water losses; 6) installing

and maintaining off-stream livestock watering facilities; 7) investigating and using alternative less water intensive livestock forage; and 8) implementing a comprehensive irrigation water management plan developed by NRCS.

2. **Conserving or Restoring Riparian Habitats.** Specific actions include, but are not limited to: 1) installing and maintaining fences that manage livestock within or exclude livestock from the riparian zones; 2) installing and maintaining off-stream livestock watering facilities; 3) replanting or transplanting native riparian vegetation such as willows; 4) implementing prescribed grazing plans; and 5) curtailing or relocating any ranching activities that degrade riparian habitats.
3. **Removing Barriers to Fluvial Arctic Grayling Movement.** Specific actions include, but are not limited to--1) removing physical barriers to restore a “natural” stream channel; 2) installing fish ladders or other appropriate fish passage devices to permit fluvial Arctic grayling movement past irrigation structures (diversions) at all flows; and 3) redesigning and reconstructing diversion structures to facilitate fish passage where ladders or retrofitting is not feasible.
4. **Addressing Entrainment Threats.** Specific actions include, but are not limited to: 1) permitting the Agencies access to irrigation ditches to perform surveys leading to a comprehensive assessment of entrainment threats; 2) allowing the Agencies to rescue entrained fluvial Arctic grayling; and 3) installing fish screens or other fish-exclusion devices as necessary to eliminate specific entrainment problems.

Complementary conservation measures or actions implemented by Participating Landowners under the CCAA that would benefit fluvial Arctic grayling include:

1. Allowing the Agencies to conduct an assessment of baseline environmental conditions and land- and water-use practices necessary to develop a comprehensive site-specific plan for their enrolled lands.
2. Allow agency or agency representative access to Participating Landowner’s property for the purposes of--1) assessing the fishery resources and status of fluvial Arctic grayling in natural streams and irrigation ditches; 2) salvage of entrained fish in irrigation ditches; 3) removing barriers; 4) assessing riparian habitat conditions and associated land-use activities; 5) implementing conservation measures, and conducting compliance; and 6) biological monitoring pursuant to the CCAA and site-specific plan.
3. Actively pursuing funding, as necessary, to implement the CCAA and site-specific plans.
4. Allowing translocation, if necessary, of fluvial Arctic grayling into suitable unoccupied habitats in streams on or adjacent to their enrolled lands to expand the species’ distribution and abundance in the Big Hole River watershed.

The CCAA identifies timelines linked to the enrollment date of Participating Landowners for when assessment, planning, and implementation of conservation measures shall be initiated or completed on the enrolled property. The Agencies have developed a phased implementation



schedule described in the CCAA intended to efficiently address immediate threats to grayling and facilitate the timely completion of site-specific plans. The CCAA also has timelines to reach objectives independent of the overall extent of enrollment, notably the attainment of targets for instream flow and the biological response of grayling. Failure to reach these targets will initiate the implementation of additional conservation actions, primarily on the part of the Agencies. However, Participating Landowners may be approached for additional assistance.

Each site-specific plan developed by enrolled landowners and the interdisciplinary Agency team must minimize or eliminate all threats to fluvial Arctic grayling that are under their control on their enrolled properties in order to provide a conservation benefit to the species and meet issuance criteria. The Service shall review each site-specific plan to determine whether it meets issuance criteria and the terms of the CCAA before approving the plan and signing the Certificate of Inclusion that provides the landowner with the full ESA regulatory protection provided by the Service's CCAA final policy (64 FR 32726). If the parties cannot reach an agreement on these measures and the Service determines the measures are not likely to result in the conservation benefits intended by the CCAA, then the Service will not approve the site-specific plan and the landowner will no longer be enrolled in the CCAA.

Should the Participating Landowner or MFWP be found out of compliance with the conditions of the Permit, the CCAA, or site-specific plan, the Service retains the authority and discretion to suspend or revoke, in part or whole, the Permit or the Certificate of Inclusion, consistent with current regulations described in 50 CFR 13.28(a).

For references and additional details, the reader is referred to the CCAA (MFWP et al. 2006).

## **II. STATUS OF THE SPECIES IN THE PROJECT AREA AND EFFECTS TO FLUVIAL ARCTIC GRAYLING**

### **A. STATUS OF THE SPECIES IN THE PROJECT AREA**

#### **Fluvial Arctic Grayling Status**

Vincent (1962) and Kaya (1992a) synthesized accounts of Arctic grayling occurrence and abundance from historical surveys and concluded that Arctic grayling of the upper Missouri River basin were widely but irregularly distributed above the Great Falls in Montana and in northwest Wyoming within the present-day location of Yellowstone National Park (Vincent 1962); and were estimated to inhabit up to 2,000 kilometers (1,250 miles) of stream habitat until the early 20th century (Kaya 1990, 1992a). Kaya (1990, 1992a) also concluded that the fluvial (river-dwelling) form was the dominant life history for the upper Missouri River basin.

Fluvial Arctic grayling were documented in the drainages of the Sun, Smith, Jefferson, Beaverhead, Big Hole, Madison, Gallatin, Gibbon, and Firehole Rivers; and Grayling, Bridger, Bozeman, and Fan Creeks (Kaya 1990, 1992a). The distribution of native Arctic grayling in the upper Missouri River apparently went through a dramatic decline in the first 50 years of the 20th century (Vincent 1962; Kaya 1992a). The indigenous

fluvial populations that formerly resided in the Smith, Sun, Jefferson, Beaverhead, Gallatin and Ruby River drainages; and Grayling, Bridger, Bozeman, and Fan Creeks are believed extirpated (Kaya 1990, 1992b).

The remaining indigenous "fluvial" populations appear to be confined to the Big Hole River and the Madison River upstream from Ennis Reservoir. Presently, the only confirmed self-sustaining remnant of the indigenous fluvial Arctic grayling population in the upper Missouri River basin exists in approximately a 125-kilometer (80-mile) segment of the Big Hole River and some of its tributaries (Montana), an area estimated to represent 5 percent or less of the historical range (Kaya 1992a). A remnant native Arctic grayling population also exists in the Madison River near Ennis Reservoir. This Madison River-Ennis Reservoir population was presumably fluvial before construction of the dam that created Ennis Reservoir in 1906; however, the population now exhibits an adfluvial life history (spawning in the river, rearing in the reservoir) probably because of this habitat alteration. Big Hole River and Madison River-Ennis Reservoir grayling appear to be genetically quite similar (Leary 1990), so the Service considers these two populations the remaining remnants of the once widespread fluvial life history in the upper Missouri River basin. Overall, Kaya (1992a) estimated that the fluvial Arctic grayling has been extirpated from about 95 percent of its historic range.

In response to a listing petition, the fluvial Arctic grayling in Montana were the subject of a status review by the Service in 1994 (59 FR 37738), which identified Arctic grayling indigenous to the Big Hole and Madison Rivers as elements of a fluvial distinct population segment (DPS) in the upper Missouri River (i.e., upper Missouri River DPS of fluvial Arctic grayling). In 2004, the Service reviewed the available information concerning the taxonomic status of the species in relation to the DPS policy and again concluded the existence of an upper Missouri River DPS of fluvial Arctic grayling having two extant elements in two locations--the Big Hole River and Madison River-Ennis Reservoir. This determination was presented in detail in the Service's candidate assessment form for fluvial Arctic grayling dated May 11, 2005.

### **Restoration Efforts**

The MFWP established the Fluvial Arctic Grayling Workgroup (Workgroup) in the late 1980s to conserve and restore fluvial Arctic grayling in the upper Missouri River, and provide guidance for restoration and management. The Service, along with the U.S. Forest Service, National Park Service, State agencies, universities, and private organizations, has participated in the Workgroup since the early 1990s. In 1995, the Workgroup developed and approved a restoration plan for fluvial Arctic grayling which outlined a strategy and necessary actions for monitoring existing populations, conducting scientific studies to better understand factors limiting the species, and reestablishing additional populations of the species within its historic range (MFWP et al. 1995). In 1996, the Service recognized this restoration plan as the conservation strategy that will guide restoration and monitoring for the fluvial Arctic grayling in the upper Missouri River by entering into a Memorandum of Agreement (MOA) with MFWP (MFWP and Service 1996). The MOA's general restoration approach was to--

a) reestablish four additional fluvial Arctic grayling populations in historic waters outside the Big Hole River, and b) secure and expand the existing population in the Big Hole River. To this end, the agreement delineated steps and timeframes toward reestablishing four fluvial Arctic grayling populations (i.e., restoration goal), and population parameters for the existing remnant population in the Big Hole River. Timelines for successful establishment of additional fluvial Arctic grayling populations have passed and the population parameters for the Big Hole River have not been achieved in recent years, and the Workgroup is currently revising the restoration plan. Attempts to reestablish additional populations of fluvial Arctic grayling outside the Big Hole River are expected to remain a focal point of the revised restoration plan, because population redundancy of the fluvial life history is needed to reduce the overall threat of extirpation of the DPS from stochastic events.

The listing priority number for the fluvial Arctic grayling is currently at 3, which is the highest that can be assigned to a DPS. This high listing priority is because the last remaining confirmed fluvial population in the Big Hole River is at very low abundance and at risk from combined effects of existing land and water use practices in the system and continuing widespread drought in southwestern Montana (70 FR 24898, May 11, 2005).

The current status of fluvial Arctic grayling in the Big Hole River project area is discussed in detail in the Service's Conference Opinion and is summarized here. The MFWP has used a combination of electrofishing and snorkeling to monitor grayling in the Big Hole River since the early 1980. The conclusions below are based the Service's interpretation of MFWP data and monitoring reports.

Poor recruitment concurrent with regional drought conditions has produced a demographically imbalanced population. Recruitment of age-0 (young-of-the-year) Arctic grayling into the population was very low during 1999-2002 and again in 2005 (fewer than 30 captured each year; Magee and Lamothe 2003, 2004; Magee et al. 2005; MFWP, Dillon, Montana, unpublished data). However, comparatively strong recruitment (n=363 age-0 captured) was observed in 2003 (Magee and Lamothe 2004) and fair recruitment was noted in 2004 (n=134 age-0 captured; Magee et al. 2005). In addition to resulting in overall low abundance, the effect of consistently poor recruitment over a period comparable to the lifespan of the species has resulted in a skewed population structure such that adult grayling now appear to be rare (e.g., Magee et al. 2005), and on a percentage basis most of the population resides in a cohort that will reach maturity in spring 2006.

Electrofishing data indicate that age-1 and older fluvial Arctic grayling population fluctuated in relative abundance between 1989 and 1999, but began to significantly decline thereafter (see Conference Opinion). Most striking in terms of the overall population is the steep downward trend for age-1 and older grayling during 2003-2005, culminating in the lowest index of abundance value over the 16-year period considered. During 2005 electrofishing surveys across 52 miles of river only 81 grayling were

captured within the project area. Overall, the data strongly suggest that fluvial Arctic grayling in the Big Hole River may currently exist at their lowest recorded abundance and that the population has been in a downward trend over the past 5-7 years.

## **B. CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES STANDARD AND THE FIVE THREAT FACTORS FOR FLUVIAL ARCTIC GRAYLING IN THE PROJECT AREA**

The Service's CCAA final policy (64 FR 32726) identifies the "CCAA standard" that must be met so the Service can issue the Permit to MFWP for the proposed CCAA. To meet this standard, the Service must determine that the benefits of the conservation measures implemented by a property owner under a CCAA, when combined with those benefits that would be achieved if it is assumed that conservation measures also were to be implemented on other necessary properties, would preclude or remove any need to list the covered species.

The CCAA standard is applied to every proposed CCAA, regardless of whether the CCAA is a single landowner agreement covering only a small portion of a species' range or a programmatic agreement encompassing much of a species' range. Evaluation of a proposed CCAA relative to the CCAA standard per the CCAA policy and an actual listing determination according section 4 of the ESA are separate actions, though they both consider the five ESA listing factors (see below). Thus, a small-scale single landowner CCAA can meet the CCAA standard so long as it addresses all the relevant threats to the species on the enrolled property, but may not necessarily preclude listing under section 4 of the ESA because different threats may exist on other properties not covered by the CCAA (and may require a different suite of conservation measures) or the extent of the CCAA is too limited relative to the range of the species. Application of the CCAA standard can be scale independent but the scope of the analysis must focus more specifically on the applicable threats addressed on the potentially enrolled properties.

The proposed grayling umbrella CCAA encompasses approximately 4-5 percent of the presumed historical range of fluvial Arctic grayling and includes the core occupied habitat for the remaining confirmed fluvial population of the upper Missouri River DPS of fluvial Arctic grayling that inhabits the Big Hole River (note: the Madison River-Ennis Reservoir population exhibits an adfluvial life history). The CCAA standard applied to the proposed grayling umbrella CCAA focuses on habitat occupied or at least seasonally utilized by a self-sustaining population of grayling exhibiting a fluvial life history (i.e., the Big Hole River population). The scope of this CCAA standard analysis is constrained to the Big Hole River, and does not consider risks to the overall DPS related to absence of additional (replicate) self-sustaining fluvial populations in historical waters outside the Big Hole River watershed.

When making a decision to list a species under the ESA, the Service is required to determine whether the species is threatened by any of the following factors: 1) the present or threatened destruction, modification, or curtailment of its habitat or range;



- 2) overutilization for commercial, recreational, scientific or educational purposes;
- 3) disease or predation; 4) the inadequacy of existing regulatory mechanisms, or
- 5) other natural or manmade factors affecting the species' continued existence.

**1) The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range**

The fluvial Arctic grayling in the Big Hole River faces ongoing threats from habitat loss, degradation and fragmentation resulting from historical and current land and water use practices. In the Big Hole River watershed, local land and water use has affected surface water hydrology, riparian zone conditions, stream morphology, thermal characteristics, and possibly nutrient inputs to the aquatic system (Kaya 1990; OEA 1995; Lohr et al. 1996; Lamothe and Magee 2004; Confluence Consulting Inc. et al. 2003). The operation of irrigation systems in the Big Hole has apparently led to the direct fragmentation of stream habitats.

**Surface Water Hydrology** - The predominant land use in the upper Big Hole watershed is irrigated agriculture for hay production and livestock pasture. Irrigation demands on the system are very high because of the over allocation of water rights, the difficult to control and inefficient surface water (flood) irrigation systems, a recent shift to increased pasture grazing, and a continuing drought. These demands have resulted in significantly reduced instream flows that pose a major threat to grayling. Reduced streamflows can reduce the growth and survival of grayling through reducing the available habitat.

**Riparian Zone (Streamside) Conditions** - Riparian zones are critical for the ecological function of most aquatic systems (Gregory et al. 1991). Loss of riparian zones through streamside livestock grazing and direct removal of natural vegetation has led to degradation of adjacent stream habitat in the upper Big Hole River (OEA 1995; Confluence Consulting Inc. et al. 2003; Lamothe and Magee 2004).

**Stream Morphology** - The combination of reduced instream flows and loss of riparian habitats in the Big Hole River has led to decreased channel stability, increased erosion, and channel widening (e.g., Confluence Consulting Inc. et al. 2003). In concert, these changes have led to habitat simplification such as a reduction in pool and riffle sequences. Reduced habitat diversity affects grayling by decreasing the distribution and frequency of necessary spawning, feeding and refuge habitats.

**Water Quality - Thermal Impairment and Nutrients** - Reduced stream flows during summer, reduced shading because of riparian vegetation removal, and channel widening are factors combining to increase water temperatures by making surface waters more sensitive to solar radiation. Thermal alterations via increased summer water temperatures pose a threat to grayling in the mainstem Big Hole River (e.g., Lohr et al. 1996; Magee and Lamothe 2004).

**Nutrient Enrichment May be a Potential Problem in the Upper Big Hole River -** (Confluence Consulting Inc. et al. 2003 and reference therein). Further data are needed to determine if nutrient enrichment is affecting water quality to the extent that grayling are being harmed. However, the potential for fertilizers applied to irrigated lands and livestock waste provide sources of nutrients to the river appears substantial given the surface (flood) irrigation techniques utilized in the upper Big Hole River basin.

**Habitat Fragmentation** - The presence and operation of irrigation diversions can fragment Arctic grayling habitat in at least two ways. First, cross channel diversions may block fish passage under all or some flow conditions, impeding grayling access to necessary spawning, rearing and refuge habitats. Second, irrigation diversions and ditches may entrain (inadvertently capture) grayling (e.g., Shepard and Oswald 1989; MFWP et al. 2006).

## **2) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes**

Arctic grayling in the upper Big Hole River are handled for scientific and recreational purposes. The Service has no data to indicate that population monitoring (scientific utilization) conducted by MFWP is a threat to the grayling.

Arctic grayling are easily caught by anglers (Alberta Sustainable Resource Development 2005), and historical angling exploitation likely contributed to, or initiated, past declines or local extirpations throughout the upper Missouri River DPS (Vincent 1962). Currently, catch-and-release regulations are in effect for Arctic grayling in rivers in Montana and sections of the Big Hole River are closed to angling under specific low streamflow and high temperature thresholds. Byorth (1993) investigated angling pressure, catch rates, hooking wounds, and capture mortality of grayling in the Big Hole River during summer 1992 and concluded that angling was not limiting the population. The effect of cumulative mortality from repeated catch-and-release hooking of grayling is unknown, but warrants further investigation given the high catchability of the species (e.g., Alberta Sustainable Resource Development 2005).

## **3) Disease or Predation**

The Service has no data to indicate that any diseases or parasites are limiting the population. Arctic grayling are resistant to whirling disease (Hedrick et al. 1999), but are susceptible to bacterial kidney disease. However, bacterial kidney disease tends to affect captive rather than wild populations (Myers et al. 1993; Peterson 1997).

Predation by nonnative trout is thought to limit fluvial Arctic grayling in some situations (Kaya 1992a, b). Nonnative brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), and brown trout (*Salmo trutta*) are well established with locally abundant populations throughout the upper Missouri River drainage

including the Big Hole River. Grayling apparently have particular difficulty coexisting with predatory brown trout (e.g., Kaya 2000). Overall, the decline of grayling in the upper Missouri River coinciding with encroachment by nonnative trout (Vincent 1962; Kaya 1990, 1992a, 2000), and the difficulty in reestablishing grayling populations where nonnatives are present (Kaya 1992b) provide circumstantial evidence of predatory threats from nonnative trout, and especially brown trout, in the Big Hole River.

The Service has no data to indicate that avian and mammalian predators are limiting fluvial Arctic grayling populations in the Big Hole River.

#### **4) The Inadequacy of Existing Regulatory Mechanisms**

There are no specific Federal regulatory mechanisms currently in place to protect fluvial Arctic grayling in the Big Hole River. The MFWP instituted catch-and-release angling restrictions for fluvial Arctic grayling, and also have a policy to suspend recreational angling under drought conditions. However, fluvial Arctic grayling are easily caught by anglers (e.g., Alberta Sustainable Resource Development 2005), and historical angling exploitation likely contributed to, or initiated past declines or local extirpations throughout the upper Missouri River DPS (Vincent 1962).

#### **5) Other Natural or Manmade Factors Affecting Its Continued Existence**

Drought is a significant threat to the well being of fluvial Arctic grayling populations in the upper Missouri River basin. Southwestern Montana has experienced a severe drought since 1999 which has exacerbated the impacts of water withdrawals in the upper Missouri and Big Hole River basin. Reductions in populations of fluvial Arctic grayling and nonnative trout in the Big Hole River appear to coincide with periods of drought (Magee and Lamothe 2003, 2004).

Competition with nonnative species including brook trout, rainbow trout, and brown trout may affect fluvial Arctic grayling in the Big Hole River. However, strong, direct evidence of competitive effects such as reduced growth or emigration direct have not yet been measured. For example, research on competition between grayling and nonnative brook trout found little evidence that brook trout negatively affected microhabitat use or growth of juvenile (age 1) hatchery reared and wild Arctic grayling (Byorth and Magee 1998). However, the authors recognized that further studies are necessary to determine whether competition occurs at other life stages or with brown trout or rainbow trout. Grayling in the Big Hole River have coexisted with brook trout for at least 50 years, but the overall decline of fluvial Arctic grayling through its historic range in the upper Missouri River concurrent with encroachment by nonnatives still provides circumstantial evidence that competition can affect grayling.

Climate change (global warming) is predicted to result in habitat loss and fragmentation for salmonid species in the Rocky Mountains (Keleher and Rahel 1996), and should place further thermal constraints on grayling in the Big Hole River (Lohr et al. 1996) if other habitat conditions do not improve.

Fluvial Arctic grayling in the Big Hole River are possibly subject to environmental and genetic problems that threaten many small populations and increase the risk of extirpation.

### **C. ANALYSIS OF CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES RELATIVE TO THE FIVE THREAT FACTORS**

#### **1) The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.**

The CCAA directly addresses all the major habitat-related threats currently believed to limit the grayling population in the Big Hole River. The conservation measures to be implemented by Participating Landowners and the Agencies are expected to improve stream flow conditions and water quality, maintain or restore riparian habitats, rescue any grayling entrained in irrigation ditches and provide a comprehensive assessment of entrainment threat, and facilitate fish passage. Collectively, these measures are expected to increase the abundance and distribution of fluvial Arctic grayling in upper Big Hole River by addressing key impairments to properly functioning stream ecosystems including alterations in the flow regime, reduced water quality and quantity, and degradation and fragmentation of habitat.

#### **Surface Water Hydrology**

The combination of improved control over diversions, compliance with water rights, supplemental flow agreements, and irrigation management programs are expected to result in dramatic improvements in streamflows within the project area. An objective of the CCAA is to improve streamflows in the Project Area such that they follow a more natural hydrograph that provides adequate streamflows for grayling spawning in the spring, bankfull discharge events that creates and maintains fish habitat, and baseflow conditions that eliminate human-caused dewatering and provides adequate conditions for rearing, sheltering and migration.

Stream fishes like fluvial Arctic grayling typically require spawning, rearing, and refuge habitats that are often separated in space and time (Northcote 1995; Schlosser and Angermeier 1995). Fluvial Arctic grayling in the Big Hole River undertake extensive seasonal intra-basin movements to access these habitats in response to life history requirements or stressful environmental conditions (Shepard and Oswald 1989; Lamothe and Magee 2003). Dewatering impedes movement between habitats, thus reducing growth, survival, or reproduction. The increased flows expected by implementing the conservation measures of the CCAA are expected to remedy this problem.

High flows (bankfull discharge events) are critical for maintaining the fluvial processes of erosion and deposition that influence channel morphology and creation of habitat (Baron et al. 2002 and references therein). High discharge events mobilize streambed sediments and promote scour, leading to creation of pool habitat often utilized by fluvial Arctic grayling (e.g., Byorth and Magee 1998; Magee and Lamothe 2003). Working with Participating Landowners to reduce irrigation diversions during periods of high streamflows should increase the amplitude and duration of high-flow events, for example bankfull flows, that are expected to improve general habitat conditions for salmonid fishes by flushing fine sediments which tend to reduce spawning success (Bjornn and Reiser 1991).

### **Riparian Zones**

Riparian zones are often critical for the ecological function of aquatic systems (Gregory et al. 1991). Riparian habitats dissipate stream energy during floods, filter sediments and pollutants, facilitate groundwater recharge, cool streams by shading, stabilize streambanks, maintain channel characteristics, promote floodplain development via deposition of sediments during overbank flows, input woody debris, organic material, and terrestrial insects (Bjornn and Reiser 1991; Hunter 1991; Murphy and Meehan 1991; Prichard et al. 1998; Poole and Berman 2001).

Loss of riparian zones in the upper Big Hole River because of agricultural activities, including streamside livestock grazing and direct removal of natural vegetation, has led to degradation of adjacent stream habitat (Confluence Consulting et al. 2003; Lamothe and Magee 2004). Fortunately, riparian habitats sometimes respond quickly when grazing pressure is reduced, depending on climate, soil characteristics, groundwater, and adjacent land use (Platts 1991). The CCAA includes a suite of conservation measures to reverse these conditions, including livestock exclusion fencing, prescribed grazing plans, and active restoration and replanting of native vegetation.

These measures are expected to produce significant improvements in riparian health and channel morphology. The protection of existing high-quality riparian habitats and the restoration of degraded or lost riparian habitats outlined in the CCAA are expected to result in increased streambank and channel stability, reduced erosion and fine sediment deposition, reversal of channel widening, improved water quality and availability, creation of pool habitats with adequate overhead cover utilized by grayling (Lamothe and Magee 2003), maintenance of high-quality spawning habitats, and reversal of thermal impairments.

## **Stream Morphology**

Increased streamflows and recovery of riparian habitats is expected to reduce effects to grayling from habitat degradation caused by changes in stream morphology. Natural stream channel adjustment leading to increased pool frequencies, decreased width-to-depth ratios may take a number of years, but active channel restoration is an option to accelerate this process under the CCAA.

## **Water Quality**

Increased streamflows resulting from implementation of the conservation measures is expected to reduce the frequency of thermal impairments to water quality in the Big Hole River, especially high summer water temperatures known to be stressful to salmonid fishes like grayling that depend on cold, clean water (Lohr et al. 1996; Magee and Lamothe 2003). Increased flows will result in lower summer water temperatures because a larger volume of water takes more energy (solar radiation) to heat. Increased flows, in combination with improved riparian conditions that increase stream shading and restored channel morphology that results in narrower, deeper channels will further reduce thermal impairments. Stressful thermal conditions may naturally occur in the system, for example during drought or climate change, but increased flows will increase the abundance and quality of cool-water refuge habitats like the deep pools (Hughes 1992, 1998; Byorth and Magee 1998; Lamothe and Magee 2003) or tributary streams utilized by grayling (Magee and Lamothe 2004).

Removal of livestock containment areas from riparian zones and more judicious use of fertilizers in agricultural operations under NRCS' nutrient management guidelines is expected to reduce stream nutrient loading.

## **Fragmentation**

Rescue (salvage) efforts, installation of fish screens, and improvements to irrigation structures are expected to reduce potential loss of fluvial Arctic grayling from entrainment in irrigation ditches. Mortality in irrigation ditches may result from stranding in a ditch or field, thermal stress, or predation. Sub-lethal effects, such as reduced growth or chronic stress, may be associated with temporary residence in irrigation ditches with poor water quality (e.g., high temperatures, agricultural runoff) or lacking adequate feeding or refuge habitat.

The comprehensive entrainment survey and threat assessment will produce a detailed prioritization list to focus the Agencies' efforts. If entrainment in irrigation ditches is identified as a population-level problem for grayling in the system, then reducing this threat will lead to a direct increase in the number of grayling in natural stream channels where their survival and growth would presumably be greater. The

Agencies are committed to monitoring entrainment and conducting rescue operations throughout the term of the CCAA, as this threat may fluctuate in time and space depending on grayling population response and changes in habitat conditions.

The removal of migration barriers will allow grayling access to a greater portion of the watershed, and increase access to seasonally important habitats including spawning, feeding, wintering, and refuge. Grayling should thus respond, if previously blocked from these necessary habitats, through greater reproductive success, and increased survival and growth of all age classes. Since most of the barriers are expected to be associated with irrigation diversion structures, the modification of these structures will not only allow passage, but also may reduce entrainment of grayling during downstream migrations.

Collectively, the proposed CCAA appears to address the key land and water-use issues that affect the quality and extent of fluvial Arctic grayling habitat in the upper Big Hole River. Habitat-related threats to grayling are interdependent and cannot be addressed in isolation. For example, increased streamflows must be coupled with conservation and restoration of riparian habitats to provide maximum conservation benefits to grayling. Development of site-specific plans for Participating Landowners is expected to ensure that all relevant habitat-related threats to grayling are integratively and comprehensively on each enrolled property.

Grayling are expected to respond to the CCAA by increasing their abundance and distribution in the project area. If this response does not happen as quickly as anticipated, then the Agencies will implement additional conservation measures to address the limiting factors and, if necessary, also consider translocation of grayling within the project area to facilitate recovery.

## **2) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.**

The CCAA does not directly address any potential threats in this category, but Service does not have any data suggesting this threat category is currently limiting the grayling population in the Big Hole River.

The CCAA does require the MFWP to monitor the grayling population, but the Service does not consider this monitoring a threat to the population.

## **3) Disease or Predation.**

The CCAA indirectly addresses potential threats to Arctic grayling from predation by nonnative trout by relying on existing fishing regulations, Agency oversight, and possible management intervention. The State's angling bag limits remain liberal for brook trout, a possible competitor and predator. Through the CCAA, a technical advisory committee shall be established to review Arctic grayling and trout monitoring data. The advisory committee will assess the threat of nonnative trout to

grayling and provide written recommendations to the Agencies implementing the CCAA, though actual management intervention (e.g., removal or suppression of nonnatives) by MFWP is discretionary. With respect to threats from nonnative trout, the overall intent of the CCAA appears to be avoiding a situation where interactions with nonnative trout limit the ability of grayling to respond to improved habitat conditions.

#### **4) The Inadequacy of Existing Regulatory Mechanisms.**

The CCAA does not address whether existing regulatory mechanisms are adequate to protect fluvial Arctic grayling in the Big Hole River. The expected increase in grayling abundance of from implementation of the CCAA may buffer adverse effects if, in fact, regulatory mechanisms are currently inadequate.

#### **5) Other Natural or Manmade Factors Affecting Its Continued Existence.**

The recurrence, duration and severity of drought is affected by climatic conditions outside the control of the proposed CCAA. Nonetheless, the proposed CCAA is expected to reduce the relative impacts of drought on fluvial Arctic grayling in the Big Hole River. The CCAA is expected to result in fewer irrigation withdrawals and more water available for instream uses, reduced irrigation diversions when supplemental flow agreements are activated (during low streamflow periods potentially stressful to grayling), and increased quantity and quality of refuge habitats (e.g., deep pools) needed by grayling to withstand stressful environmental conditions.

The CCAA indirectly addresses potential threats to Arctic grayling from competition by nonnative trout by relying on existing fishing regulations, Agency oversight, and possible management intervention. The State's angling bag limits remain liberal for brook trout, a possible competitor and predator. Through the CCAA, a technical advisory committee shall be established to review Arctic grayling and trout monitoring data. The advisory committee will assess the threat of nonnative trout to grayling and provide written recommendations to the Agencies implementing the CCAA, though actual management intervention (e.g., removal or suppression of nonnatives) by MFWP is discretionary. With respect to threats from nonnative trout, the overall intent of the CCAA appears to be avoiding a situation where interactions with nonnative trout limit the ability of grayling to respond to improved habitat conditions.

The severity of climate change (global warming) is beyond control of the proposed CCAA. However, the increased quantity and quality of suitable grayling habitat, increased instream flows and reduced water temperatures expected under the CCAA are anticipated to buffer effects of climate change on fluvial Arctic grayling in the Big Hole River.



An increase in population size and distribution of fluvial Arctic grayling in the Big Hole River expected to result from the CCAA will correspondingly reduce genetic and stochastic risks associated with small populations.

#### **D. SUMMARY OF ANTICIPATED EFFECTS TO FLUVIAL ARCTIC GRAYLING IN THE BIG HOLE RIVER FROM THE PROPOSED CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES**

The CCAA and associated site-specific plans, if fully implemented across the 380,000-acre+ project area, are expected to result in a population increase (increased abundance and distribution) of fluvial Arctic grayling in the Big Hole River. The conservation measures to be implemented appear to address all the major habitat-related threats facing the species in that watershed.

The net conservation benefits for fluvial Arctic grayling will vary through time and will depend on the type of threats being addressed. Implementation of conservation measures required by the CCAA that provide immediate improvements to instream flows, such as water rights compliance and installation of properly functioning headgates; provide passage to migrating grayling; or rescue grayling entrained in irrigation ditches may result in improved growth and survival of individual grayling. These positive effects are anticipated in the initial years of the CCAA. Other threats will take longer to ameliorate, because some factors, such as habitat simplification, channel modification, thermal loading, natural revegetation of riparian zones, may take 10 or more years to remedy. While a measurable net conservation benefit for fluvial Arctic grayling is expected after 5 years of CCAA implementation (in terms of a positive trend in abundance), the full conservation benefits of the CCAA may take 10 or more years to accrue because of the time needed to implement conservation measures and the anticipated recovery time of stream and riparian habitats to habitat improvements.

### **III. ENHANCEMENT OF SURVIVAL PERMIT CRITERIA – ANALYSIS AND FINDINGS**

#### **1. The taking of fluvial Arctic grayling will be incidental to an otherwise lawful activity and will be in accordance with the terms of the Candidate Conservation Agreement with Assurances.**

The Service finds that any take of the fluvial Arctic grayling in the upper Big Hole River watershed authorized under the permit (i.e., resulting from covered activities described in the CCAA) will be incidental to otherwise lawful activities and not the purpose of such activities. Incidental take is expected to result from otherwise lawful agricultural and ranching activities conducted at levels specified in the CCAA and site-specific plans and in accordance with applicable local, State, and Federal laws. Examples of covered agricultural and ranching activities include irrigation and stock water withdrawals that reduce the quality and quantity of grayling habitat, entrainment in irrigation ditches, livestock grazing in riparian zones, and operation of diversion structures that affect fish passage (MFWP et al. 2006, pp. 79-80, 124-125).

Participating Landowners are responsible for obtaining other authorizations, if any, necessary under State, Federal, or local laws and regulations in order to carry out these activities.

Other covered activities include those actions necessary to implement the CCAA and measure its effectiveness and include habitat restoration projects and biological monitoring of the grayling population.

The validity of the enhancement of survival permit is conditioned upon strict observance of all applicable State, local, or other Federal laws.

**2. The Candidate Conservation Agreement with Assurances complies with the requirements of the Service's Candidate Conservation Agreement with Assurances policy.**

Based, in part, on the analysis provided in Part II of this document that examines the effect of the CCAA on fluvial Arctic grayling in the Big Hole River relative to the five ESA threat factors, the Service finds that the proposed CCAA meets the "CCAA standard" described in the CCAA Final Policy. Specifically, the Service finds that the CCAA's conservation measures and expected benefits to fluvial Arctic grayling in the Big Hole River, when combined with those benefits that would be achieved if it is assumed that similar conservation measures also were implemented on "other necessary properties" within the currently occupied range of the species, would preclude or remove the need to list the species, as described in the CCAA Final Policy.

The Service notes that this CCAA covers approximately 4-5 percent of the presumed historic range of the upper Missouri River DPS of fluvial Arctic grayling and largely encompasses the only remaining self-sustaining fluvial population of the DPS that occupies the Big Hole River. With respect to the CCAA standard, the scope of "other necessary properties" for this proposed CCAA is restricted to waters occupied by self-sustaining fluvial Arctic grayling populations (i.e., Big Hole River). In effect, the CCAA standard is being applied as if the Big Hole River population is equivalent to the listable entity described by the DPS even though the Big Hole River fluvial Arctic grayling is actually one component of the currently-defined upper Missouri River DPS of fluvial Arctic grayling. This is an appropriate application of the CCAA policy in cases where a proposed CCAA only covers a portion of the species' (or DPS') range and where different conservation measures (e.g., translocations) may be necessary to conserve and reduce threats to the larger entity.

The CCAA also complies with all other requirements of the CCAA policy.

**3. The probable direct and indirect effects of any authorized take of fluvial Arctic grayling will not appreciably reduce the likelihood of survival and recovery in the wild of the species.**

The Service reviewed issuance of a section 10(a)(1)(A) enhancement of survival permit to MFWP under section 7 of the ESA. In a conference opinion (Service 2006), the Service concluded that the direct and indirect effects of implementing the CCAA and issuing the permit that exempts a specified level of incidental take, would not appreciably reduce the likelihood of survival and recovery of fluvial Arctic grayling or any ESA listed species in the wild.

Implementation of the CCAA is expected to lead to a suite of conservation actions and changes in existing land and water use activities in the Big Hole River watershed anticipated to produce immediate and direct beneficial effects to Arctic grayling. Adverse impacts associated with implementation of conservation measures (e.g., ground disturbance to implement conservation measures, biological monitoring, etc.) under the CCAA are expected to be minor, and should be offset and exceeded by beneficial and long-lasting effects of the CCAA to Arctic grayling and its habitat. The level of adverse impacts from past and present land and water use activities, especially irrigation and livestock grazing, will be reduced from implementation of site-specific plans such that the environmental baseline will be improved (i.e., net conservation benefit). Future possible indirect effects from nonnative trout will be monitored by the Agencies participating in the CCAA. The level of incidental take exempted under the CCAA is defined as that which occurs when Participating Landowners, MFWP, and the cooperating agencies are implementing Service-approved site-specific plans that are designed to reduce threats to Arctic grayling in enrolled land. By extension, any noncompliance with the site-specific plans or the CCAA may mean the level of exempted take has been exceeded, which would lead to corrective actions implemented by landowners and the Agencies, or else the protective coverage of section 7(o)(2) may lapse. The MFWP's biological monitoring program for fluvial Arctic grayling is expected to result in take of no more than 15 individuals per year. The Service expects the actual amount of this take to be less because professional fishery biologists familiar with grayling will surveys, capture and handling of grayling will occur under approved protocols so that injury and stress are minimized, and monitoring will be reduced or suspended monitoring surveys when environmental conditions are stressful for coldwater fishes.

**4. Implementation of the terms of the Candidate Conservation Agreement with Assurances is consistent with applicable Federal, State, and Tribal laws and regulations.**

The CCAA is consistent with all applicable Federal and State laws and regulations. There are no known Tribal laws or regulations applicable to the CCAA.

The section 10(a)(1)(A) enhancement of survival permit issued to MFWP exempts a specified level of incidental take in accordance with the CCAA and the ESA. The MFWP, NRCS, MDNRC, and Service are responsible for obtaining other authorizations, if necessary, under State, Federal, or Local laws or regulations to carry out any activities required by the CCAA. The validity of the Permit will be conditioned upon observance of all applicable State, local, or other Federal law.

In accordance with the National Environmental Policy Act (NEPA), the Service prepared a joint Environmental Assessment (EA) with MFWP. The Service issued a Finding of No Significant Impact (FONSI) on issuance of the Permit to MFWP and implementation of the CCAA.

The issuance of the permit is an undertaking as defined by the National Historic Preservation Act (NHPA). Issuance of the permit, in and of itself will not affect cultural and historic resources, but implementation of the CCAA, enrollment of landowners, and development and implementation of site-specific plans may affect cultural and historic resources. Any ground-disturbing activities required to implement the CCAA or any site-specific plan would require a site-specific analysis from the State or Federal agency (e.g., under the Montana Environmental Protection Act, NEPA, or the NHPA) leading or coordinating the specific project as well as possible consultation with the Montana State Historical Preservation Office, so cultural and historical resources in the project area would be not be affected.

**5. Implementation of the terms of the Candidate Conservation Agreement with Assurances will not be in conflict with any ongoing conservation programs for fluvial Arctic grayling.**

The Service finds that approval of the CCAA and issuance of the permit will not be in conflict with any ongoing conservation programs for the fluvial Arctic grayling. In fact, the CCAA will complement ongoing efforts to conserve fluvial Arctic grayling in the upper Missouri River.

As described in Part II of this document (see Part II of this document, Restoration efforts) the State of Montana (MFWP) has led efforts to conserve fluvial Arctic grayling in the upper Missouri River since the 1980s. A centerpiece of these efforts has been implementation of a 1995 Restoration Plan, and an associated MOA between MFWP and the Service recognizing this Plan, aimed at (a) securing and expanding the Big Hole River grayling population, and (b) reestablishing four additional fluvial Arctic grayling populations in historic waters outside the Big Hole River. The Restoration Plan is currently being revised by MFWP, but the proposed CCAA significantly expands the ongoing efforts to conserve the Big Hole River fluvial Arctic grayling population. Enhancing the Big Hole River population may supplement efforts to restore fluvial Arctic grayling in historic waters outside the Big Hole River by providing gametes for brood reserves that are used to support translocation efforts.

**6. The applicant has shown capability for and commitment to implementing all of the terms of the Candidate Conservation Agreement with Assurances.**

Signing of the legally binding CCAA by the applicant (MFWP), NRCS, MDNRC, and the Service helps insure that the CCAA will be implemented and commits all parties to obligations described in the CCAA. Implementation of the CCAA will be a condition of the permit, and a failure to perform obligations under the CCAA may be grounds for suspension or revocation of the permit and cancellation of the CCAA. The Service notes that in October 2005 MFWP, NRCS, and MDNRC signed an MOA (MFWP et al. 2005) that formalizes their commitment to implement the CCAA and provide dedicated staff to that end.

The MFWP has demonstrated their interest, capability and commitment to conservation of fluvial Arctic grayling over the past 15 years. The MFWP has monitored the status of the Big Hole River fluvial Arctic grayling population since the mid 1980s and has designated the fluvial Arctic grayling as State "Species of Concern." In the late 1980s the MFWP established the Workgroup that provided a forum for biologists, researchers, managers and the general public to provide motivate necessary scientific research, and guide management and conservation of the species in the upper Missouri River. The MFWP has chaired the Workgroup since its inception.

In 1995, the Workgroup developed and approved a restoration plan for fluvial Arctic grayling which outlined a strategy and necessary actions for monitoring existing populations, conducting scientific studies to better understand factors limiting the species, and reestablishing additional populations of the species within its historic range (MFWP et al. 1995). In 1996, the Service recognized this restoration plan as the conservation strategy that will guide restoration and monitoring for the fluvial Arctic grayling in the upper Missouri River by entering into an MOA with MFWP (MFWP and Service 1996). The MOA's general restoration approach was to a) reestablish four additional fluvial Arctic grayling populations in historic waters outside the Big Hole River, and b) secure and expand the existing population in the Big Hole River. The MFWP has attempted to reintroduce fluvial Arctic grayling in historic waters in the 1) upper Ruby, 2) Sun (South and North Forks above Gibson Reservoir), 3) lower Beaverhead, 4) Missouri (headwaters), 5) Madison, 6) Gallatin, and 7) Jefferson Rivers. Unfortunately, drought conditions may have hampered these efforts as no self-sustaining populations have been reestablished from these efforts. However, these reintroduction efforts are continuing and the Restoration Plan is currently being revised.

In the Big Hole River, MFWP has worked for over a decade with individual landowners in efforts to improve habitat conditions for fluvial Arctic grayling. Successful projects include installation of fish ladders, new irrigation headgates, and informal arrangements where irrigators reduce irrigation withdrawals. The MFWP also has implemented special fishing regulations (catch-and-release) and fishing closures (under stressful environmental conditions) to reduce impacts on fluvial Arctic grayling. The CCAA represents a significant increase in the scope and coordination of conservation activities that will be implemented to benefit fluvial Arctic grayling in the Big Hole River.

The MFWP gauged landowner interest in the proposed CCAA in April 2005, and since that time has had at least 39 Big Hole River watershed landowners representing over 250,000 acres within the proposed project area indicated their willingness to participate in the CCAA. Capitalizing on this landowner interest, MFWP (in conjunction with the partner agencies) has already begun assessing habitat conditions on properties eligible for enrollment in the CCAA, collecting data necessary to develop site-specific plans, and assessing and removing immediate threats to grayling (e.g., Petersen and Lamothe 2006).

All the Agencies participating in the proposed CCAA have increased their staffing levels and added professional personnel dedicated exclusively to implementing the CCAA. The MFWP has designated a "CCAA Program Coordinator" to lead the agency's implementation of the CCAA. This position has been supported by a \$77,000 grant from the Service's Landowner Incentives Program. The MFWP also added two additional fisheries technicians dedicated to supporting and implementing the CCAA. The MDNRC has added a hydrology technician to assist the lead hydrologist with that agency's commitments under the CCAA. Anticipating the increased workload under the CCAA, NRCS increased its local staff by two full-time range conservationists, one full-time soil conservationist, one student intern, and one volunteer. The Service's Montana Partners for Fish and Wildlife, which has been active in grayling conservation in the Big Hole River watershed for over the past decade, has a full-time biologist dedicated to implementing habitat restoration projects in the watershed and supporting implementation of the CCAA. The Service's Montana Ecological Services office has provided technical assistance and participated in development of the CCAA.

Coordinated efforts to implement provisions and conservation measures described in the CCAA are already being implemented. As described earlier, MFWP has begun habitat assessments and identification of conservation opportunities on potentially enrolled lands. The MDNRC has increased their monitoring of streamflows and irrigation ditches in the Big Hole River drainage in anticipation of the CCAA. Since 2004, NRCS has spent or obligated more than \$2.4 million to benefit fluvial Arctic grayling in the Big Hole River watershed. Notable examples include implementing special initiative Environmental Incentives Quality Program (EQIP) programs in 2004 and 2005 that reduced irrigation diversions, contracted for construction of new irrigation headgates, flow measuring devices, fish ladders, off-channel livestock watering facilities; funding entrainment surveys in irrigation ditches; supporting a grant to a watershed group that supported data collection on the irrigation system in the Big Hole River and workshops for landowners; supporting development of a water rights database to help prioritize conservation opportunities in the Big Hole River watershed; entering into cooperative agreements with MFWP and MDNRC to fund staff positions to implement the CCAA; contracting with private consultants to develop grazing plans for landowners that have expressed interest in developing site-specific plans under the CCAA; authorizing another EQIP program for 2006, and authorizing use of Technical Service Providers to support development of site-specific plans. The NRCS estimates that over

118,000 acres of grazing plans (that will be key components of site-specific plans under the CCAA) will be completed by the agency or its contractors by fall 2006 (NRCS 2006).

The Service's Montana Partners for Fish and Wildlife Program has in the past expended fund on projects to benefit fluvial Arctic grayling in the Big Hole River. The implementation of the proposed umbrella CCAA appears to be a high priority for the Partners and Ecological Services programs in Montana; however, because of requirements if the Anti-Deficiency Act, the Service is unable to specifically commit to funding the CCAA beyond those funds that have already been spent or obligated. Similar Anti-Deficiency Act requirements likely apply to NRCS. The Service believes that the commitment of public funds are necessary and appropriate to receive conservation benefits for fluvial Arctic grayling and increase enrollment and active participation in the CCAA.

The past and ongoing commitment to fluvial Arctic grayling conservation, including the recent increase in staff and leadership in development of the CCAA, and actual on-the-ground implementation of conservation measures, by MFWP indicates that it has shown the capability and commitment to implement the CCAA. Similarly, the collective efforts of the cooperating agencies, especially the financial and staff commitments made possible by the participation of NRCS, indicate commitment of those agencies to the CCAA process and the partnerships that will be necessary to fully and successfully implement the CCAA. The MOA between MFWP, NRCS, and MDNRC that formalizes these agencies' commitment the CCAA is further evidence that there is institutional commitment to implement the CCAA.

#### **IV. GENERAL CRITERIA AND DISQUALIFYING FACTORS**

The Service has no evidence that the permit should be denied on the basis of the criteria and conditions set forth in 50 CFR 13.21 (b)-(c). The MFWP has met the criteria for issuance of the permit and does not have any disqualifying factors that would prevent the permit from being issued under current regulations.

#### **V. PUBLIC COMMENTS**

The Service published a Notice of Availability of MFWP's permit application, including the draft CCAA and draft EA, on November 23, 2005 (70 FR 70877). Publication of the notice initiated a 60-day comment period, which closed on January 23, 2006.

The Service issued a press release announcing the Notice of Availability and the public comment period on November 29, 2005. This press release was forwarded to members of the Montana Federal congressional delegation, Federal and State government agencies, County governments, environmental organizations, the media, and other interested groups. The permit application, draft CCAA and draft EA were made publicly available via the internet through the Service's

Region 6 website. Copies of the documents also were sent to two interested individuals or organizations following requests the Service received after publication of the *Federal Register* notice.

The Service received written comments from 10 organizations or individuals including the Big Hole River Foundation, Big Hole Watershed Committee, Jim Hagenbarth, Center for Biological Diversity, George Grant Chapter of Trout Unlimited, Montana Chapter of Trout Unlimited and the Montana Water Project, Steve Leubeck, Pat Munday, The Nature Conservancy, and Environmental Defense. Nine of 10 comment letters expressed support for the concept, process, design, goals, or strategy of the proposed CCAA. While many of these nine positive comment letters provided suggestions to clarify, improve, or modify particular components of the draft CCAA, only one comment letter (Center for Biological Diversity) stated opposition to approval of the CCAA and issuance of the Permit.

Most of the specific comments submitted related to the content of the CCAA itself rather than the information described in the EA. Five letters specifically stated support for Alternative B presented in the EA, which is the proposed umbrella CCAA. Another letter also expressed general support for Alternative B and the Service's analysis of environmental effects supposing full implementation of the CCAA. The same letter that opposed issuance of Permit (Center for Biological Diversity) also objected to the NEPA analysis of the project, stating that the EA did not analyze a suitable range of alternatives and that an Environmental Impact Statement (EIS) should have been prepared.

We responded to all substantive comments provided by the above listed entities. Substantive comments were organized by issue and cross-referenced by the commenter. Comments organized by issue and Service replies to those comments are provided in Attachment 1.

## **VI. CHANGES BETWEEN DRAFT AND FINAL CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES**

A number of changes were made between the draft and final CCAA, none of which altered the direction or intent of the CCAA, or significantly changed the content of the CCAA. Changes were made to correct mistakes, update the CCAA to reflect new information, increase the amount of information provided on a subject or level of detail on provisions of the CCAA, or to clarify existing information provided in the CCAA. Changes and the location of those changes in the final CCAA are summarized below.

Table of contents were updated to reflect new material and pagination.

Page 7: Figure 2 changed to Figure 2a. Figure references updated throughout text.

Page 8: Map of CCAA grayling monitoring locations added as Figure 2b. Figure references updated throughout text.

Page 9: Figure 3 map was corrected to show locations of tributary streams in the Big Hole River.



Page 11: Figure 4 was updated to reflect recent analyses of long-term monitoring data by MFWP.

Page 26 and thereafter: Change of descriptive title – “Interim Diversion Reduction Arrangements” has been changed to “Supplemental Flow Agreement” or SFA. The term “Supplemental Flow Agreement” or SFA still describes an agreement between MFWP and a private landowner to reduce irrigation withdrawals to ensure adequate streamflows during periods of reduced water availability. SFA is the term currently used by MFWP when working with landowners, so changing the descriptive title in the CCAA will better characterize actual implementation of the CCAA.

Page 26: Paragraph inserted that describes the role and function of a Water Rights Technical Advisory Committee that will help the Agencies and the Participating Landowners with any modifications to water rights that may be necessary to help implementation of the CCAA. This advisory committee was formed in response to and with participation of one of the groups that commented on the CCAA (see Issue 15 under Response to Public Comments).

Page 28: Text added to description of Supplemental Flow Agreements to emphasize that these arrangements are intended to adequate streamflows representative of a more natural hydrograph, including spring spawning flows, bankfull discharge events, and sustained baseflows in summer-fall.

Page 33: Under Irrigation Water Management section, the final sentence was edited from “The final maximum irrigation diversion amount...” to “This amount...” because Supplemental Flow Agreements may, in part, specify maximum diversion amounts.

Page 34: The estimated irrigation system efficiency in the Big Hole River was changed from 15-20 percent to 10-15 percent to reflect new information collected in 2005.

Pages 36-38: Description of flow targets and the frequency of meeting those targets was updated and expanded. The text now correctly states that the flow targets are intended to be met both in spring **and** in summer-fall. Two text tables have been added that provide a snapshot of how 2005 streamflows compared to the CCAA’s streamflow targets, and a retrospective of how frequency the targets would have been met in previous years at the one location in the project area having a significant period of record for streamflows. The revisions on these pages address comments raised under Issue 14, reply to comments.

Page 38: Adaptive management trigger for streamflows and grayling population response has been corrected to indicate that both the 5-year abundance trend **and** the 10-year distribution increase must be met by year 10 of CCAA implementation. “If after this 10-year period the flow targets are not being met at the expected frequency and the grayling population has not met both the expected 5-year abundance trend and 10-year distribution increase...”

Page 38: New paragraph inserted that describes the monitoring of bankfull discharge events and baseline conditions.

Page 59: Clarifications were made in the section describing Restoration Targets for Grayling. Draft CCAA stated that the updated restoration plan would be completed by February 2006. Revision to the restoration plan is ongoing, but will be reviewed by the Workgroup when a draft is available. The text was updated to correctly state that mark-recapture sampling will be conducted, in addition to catch-per-unit-effort, when sufficient numbers of grayling are captured (Appendix 1, Issue 18 in Response to Comments). The description of the 5-year trend target for grayling was clarified to indicate that the trend should be over a 5-year period and not simply an increase in any given year.

Page 60: Correction to Adaptive Management Plan. The trigger requires that both the 5-year **and** the 10-year targets be met, not one or the other. This is a more stringent requirement that reflects MFWP's original intention.

Pages 71--75: Additional detail describing MFWP and Service enforcement actions in case of noncompliance with the CCAA has been included under the Obligations of the Partners for Participating Landowners, MFWP, and the Service; and under the Compliance Monitoring. The new text describes the written process for notifying landowners of noncompliance and provides a 7-day timeframe to return to compliance before possible suspension or revocation of the Certificate of Inclusion (see Appendix 1, Issue 11, Response to Comments). See also page 129 of example site-specific plan.

Page 78: Under Landowner Contact, the text "if agreed to by a landowner" has been deleted and replaced by "at mutually-agreeable dates and times" to properly characterize the visits as mandatory, but the specific time of those meetings as flexible (see Appendix 1, Issue 11, Response to Comments).

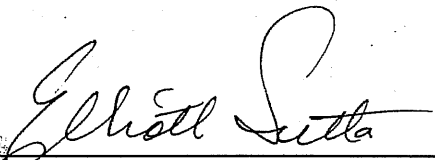
Page 79: Under Reporting, the date of the CCAA annual written report by MFWP has been moved up from May 1 to February 1 so that results can be publicly presented at the Workgroup meeting, which is typically held the end of February. The annual report also will include an accounting of project expenditures and a summary of enforcement actions. The revised text also states that the annual report will be distributed to the Agencies and widely available to other interested parties via agency websites (see Appendix 1, Issue 11, Response to Comments).

Page 81: Under Covered Activities – Restoration and Monitoring, the phrase "active restoration projects are anticipated to be infrequent and passive restoration will be the primary method for stream channel restoration" has been changed to "active restoration projects are anticipated to be less frequent than passive restoration, which will be the primary method for stream channel restoration" (see Appendix 1, Issue 10, Response to Comments).

Page 95: Table B1 has been corrected so that the water year of 5 percent exceedance (wet year) is equivalent to 1 in 20 years, and 50 percent exceedance (median year) is equivalent to 1 in 2 years.

## VII. RECOMMENDATIONS ON PERMIT ISSUANCES

Based on the foregoing findings with respect to the proposed action, I recommend issuance of a section 10(a)(1)(A) Enhancement of Survival Permit to authorize incidental taking of fluvial Arctic grayling in the upper Big Hole River, Montana, by Montana Fish, Wildlife and Parks in accordance with the Candidate Conservation Agreement with Assurances final policy.

  
\_\_\_\_\_  
Deputy Regional Director

6/1/06  
\_\_\_\_\_  
Date

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# APPENDIX 1

## U.S. FISH AND WILDLIFE SERVICE RESPONSES TO PUBLIC COMMENTS SUBMITTED FOR THE PERMIT APPLICATION, ENVIRONMENTAL ASSESSMENT, AND CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES FOR FLUVIAL ARCTIC GRAYLING IN THE UPPER BIG HOLE RIVER, MONTANA

### List of comment letters received by the Service:

1. Big Hole River Foundation
2. Big Hole Watershed Committee
3. Jim Hagenbarth
4. Center for Biological Diversity
5. George Grant Chapter of Trout Unlimited
6. Montana Chapter of Trout Unlimited and the Montana Water Project
7. Steve Leubeck
8. Pat Munday
9. The Nature Conservancy
10. Environmental Defense

Comments were compiled and organized by issues. Replies to comments specify which comment letters raised a particular issue.

Summary of public comments is provided in **Part V** of the accompanying Findings document.

No changes were made to the draft Environmental Assessment as a result of public comments. Changes to the draft Agreement are described in the reply to comments and in **Part VI** of the accompanying Findings document.



## **RESPONSES TO PUBLIC COMMENTS ON THE DRAFT AGREEMENT AND ENVIRONMENTAL ASSESSMENT**

**Issue 1:** Extent of adaptive management principles in the Agreement. Two commenters [5, 10] requested additional adaptive management provisions in the proposed CCAA.

**Reply:** The proposed CCAA requires monitoring of Participating Landowner compliance, project implementation, project effectiveness, and biological response in fluvial Arctic grayling (pp. 74-77 of CCAA). Provisions to amend or supplement the Agreement if additional conservation measures are necessary are described in the Agreement. For example, provisions described in Changed circumstances provide a mechanism to address effects of drought, wildfire, floods, adjudication of water rights and encroachment of nonnative species. Supplementary actions to be taken if conservation goals are not achieved are described after most of the four general conservation measures. An “adaptive management plan for grayling population response...” (p. 59 of CCAA) describes actions that could be taken to meet the stated population-level trends and/or new information would improve implementation of the Agreement and benefits to Arctic grayling. Thus, while the Agreement does not contain a discrete, stand-alone adaptive management section that addresses all facets of the Agreement, adaptive management principles are to be implemented in the sense that additional conservation actions will be taken if specific targets related to habitat improvement and grayling population response are not achieved.

**Issue 2:** Biological objectives and definition of recovery for the covered species. At least two commenters [1, 6] stated that the biological objectives of the CCAA were vague and that a biological definition or benchmark for an acceptable population trend or recovery was not provided.

**Reply:** The conservation goal of the Agreement is to “secure and enhance the population of Arctic grayling within the historic range of the species in the upper Big Hole River” (p. 3 of CCAA). A tangible measure of that objective will be if implementation of the Agreement leads to the “increase the abundance and distribution” of Arctic grayling in the Big Hole River as measured by a trend demonstrating increased abundance and the presence of grayling in formerly occupied habitats (p. 55 of CCAA). The CCAA describes both 5- and 10-year benchmarks for biological response of the grayling population, and additional conservation actions are required if the population does not respond as expected (see p. 59 of CCAA). The description of the 5-year trend target for grayling was clarified to indicate that the trend should be over a 5-year period and not simply an increase in any given year

In addition, the text was changed to indicate the CCAA requires that both the 5-year **and** the 10-year targets be met, not one or the other (p. 59 of CCAA).

The expected benefits of a CCAA can be described in terms of the expected increase in population numbers, the expected improvement in key habitat characteristics, the expected reduction or elimination of take, the threats to the species that will be removed by the implementation of the agreed-upon measures, or all of the above (Service 1999). While the

CCAA standard is essentially a recovery standard (64 FR 32729, June 17, 1999), an agreement need not specifically define the biological criteria for recovery, especially when the best available information is not sufficient to make that determination. The proposed CCAA describes expected benefits in terms of reducing threats, reduction of take, and the expected population response by Arctic grayling.

**Issue 3:** The CCAA issuance criteria and the CCAA standard [commenters 4, 10]. Two comments expressed concern over whether the proposed agreement meets the standards set forth in the CCAA policy.

**Reply:** The Service must find that a CCAA meets the “CCAA standard” to approve the CCAA and issue the section 10(a)(1)(A) permit to the applicant. The Service will not enter into any CCAA that does not meet the minimum standards established by the CCAA policy (64 FR 32726, June 17, 1999) and implementing regulations (50 CFR 17.22). Entering into a CCAA is voluntary for the Service and property owners; the Service will refuse to enter into a CCAA that does not meet the minimum established standards.

The CCAAs should describe existing conditions in terms of the population levels of the covered species (if determinable) and contain a description of habitat conditions. Quantitative habitat descriptions are preferred, but detailed qualitative description also may suffice. The CCAA presents information on the population status of grayling based on agency monitoring data, describes habitat factors (streamflow, riparian conditions, etc.) based on empirical data, describes population benefits in terms of abundance trends and general distribution, presents a biological monitoring program based on five management segments, and assigns agency obligations and timelines for monitoring landowner compliance.

One commenter [4] disagrees with the Service’s conclusion that the proposed agreement meets the CCAA standard. The Service has conducted its required analysis pursuant to the CCAA standard and determined that the benefits of the conservation measures implemented by a property owner enrolled under the CCAA, when combined with those benefits that would be achieved if it is assumed that conservation measures also were to be implemented on other necessary properties, would preclude or remove any need to list the fluvial Arctic grayling. Moreover, the Service has determined in its Findings that the proposed agreement meets the issuance criteria for an Enhancement of Survival Permit (50 CFR 17.22).

The Service speculates based on the comment that there may be confusion over the spatial scale at which the CCAA standard is applied relative to actual range of the species or how the CCAA standard may relate to a listing decision for the covered species.

The CCAA standard assumes that conservation measures be implemented on other necessary properties, without specific reference to how many properties or what those additional conservation measures would be in order to actually preclude the listing of a species that has been found warranted for listing. For example, conservation measures to be implemented on a 50-acre property to be enrolled in a single landowner CCAA could be found to meet CCAA standard, but may not necessarily actually preclude a listing, especially if the species faces threats outside the enrolled property or must have additional populations in other locations.

The question of whether or not the proposed CCAA actually precludes the need to list fluvial Arctic grayling relates to a status assessment and listing decision, which is a separate action from issuance of a Enhancement of Survival Permit.

**Issue 4:** Sufficiency of the Service's environmental analysis pursuant to NEPA. One commenter [4] questioned whether the environmental effects analysis contained a suitable range of alternative actions and whether an EA was the appropriate level of analysis.

**Reply:** Issuance of an enhancement of survival permit is a Federal action subject to NEPA. Where a categorical exclusion is not appropriate, an EA is prepared to briefly analyze the impacts of a proposed action to determine the significance of the impacts and to determine whether development of an EIS is needed; to analyze alternatives for proposals that involve unresolved conflicts concerning uses of available resources; and to aid an agency's compliance with achieving NEPA's purposes when preparation of an EIS is not necessary. The culmination of the EA process is either a FONSI or a decision to prepare an EIS. The Service has determined that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. As such, an environmental impact statement is not required.

The EA presented formal analysis for three alternatives – a “no action” alternative, the proposed umbrella CCAA that presumably encompasses most of the habitat occupied by Arctic grayling in the upper Big Hole River, and an umbrella CCAA restricted to segment of the upper Big Hole River near Wisdom, Montana. In addition, the Service initially considered, but excluded from formal analysis, four additional alternatives. The Service has determined that the overall range of alternatives provided sufficient breadth to consider the relative effect of the proposed action (i.e., proposed umbrella CCAA).

**Issue 5:** Adequacy of the CCAA to ensure the conservation of fluvial Arctic grayling [commenters 1, 4, 8]. A few comments [1, 4, 8] questioned whether the proposed CCAA is adequate to ensure the survival and recovery of the species.

**Reply:** The proposed CCAA directly addresses major habitat-related threats to fluvial Arctic grayling in the upper Big Hole River, including stream dewatering, riparian degradation, entrainment in irrigation ditches and habitat fragmentation. The scale of the plan addresses these threats across a large geographic area (up to 380,000 acres) for at least a 20-year period. Ameliorating these threats through implementation of the proposed conservation measures is a necessary step to conserve the grayling population in the Big Hole River. Failure to implement these conservation measures would be expected to increase the extinction risk for the species.

The proposed CCAA does not address threats to grayling outside the upper Big Hole River nor make explicit reference to ongoing efforts by MFWP to establish additional fluvial population within the historic range of the species, both of which the Service recognizes as important for conservation of the species.

**Issue 6:** Uncertainty about the effectiveness of conservation actions. One commenter [4] stated that the conservation measures had “little certainty of success.”

**Reply:** A level of uncertainty is inherent in complex and large-scale restoration efforts such as in the proposed Agreement, and CCAA explicitly describes some of this uncertainty (p. 57 of CCAA, “Uncertainty and the Proposed Conservation Measures”). It is not possible to provide precise predictions about the outcome of conservation measures implemented at the watershed scale, as proposed under the CCAA. Nonetheless, the proposed CCAA addresses major habitat-related threats to fluvial Arctic grayling in the Big Hole River, so a reasonable conclusion is that implementation of the conservation measures will improve the status of the species.

The content and conclusions of any proposed rule to list Arctic grayling, including the likelihood of extinction of the Big Hole grayling, are outside of the purview of the proposed CCAA and EA. However, the CCAA does recognize that the fluvial Arctic grayling is a priority 3 candidate species under the ESA, meaning that threats to the species are imminent and high in magnitude (70 FR 24870, May 11, 2005).

**Issue 7:** Coordinated implementation of the conservation measures. One commenter [6] raised concern that the implementation of conservation measures was not adequately coordinated.

**Reply:** The CCAA has both institutional coordination and integration of the specific conservation actions. The CCAA is a collaborative effort between interested landowners and agencies with expertise in land and water resource management. The MFWP, as the lead agency and the applicant for the Enhancement of Survival Permit, provides overall coordination of the program activities including implementation of conservation measures, effectiveness and compliance monitoring, compliance and reporting. Each agency’s obligations are specified in the proposal. The CCAA requires the completion and implementation of a site-specific plan that integratively addresses land and water management concerns which affect Arctic grayling. Thus, the CCAA provides not only a coordinated institutional structure but a comprehensive and coordinated site-specific plan for each enrolled property. Conservation actions such as increasing instream flows, improving riparian habitats, and installing fish screens in irrigation diversions are not considered independently, but will be implemented together.

**Issue 8:** Specificity of landowner obligations. One commenter [6] stated that landowner obligations to conserve water should be more specific.

**Reply:** The CCAA describes a suite of water conservation actions, including improving diversion structures, upgrading water delivery systems, establishing stock watering wells, etc., and guidelines for these actions, that will be implemented to improve instream flows. The CCAA is a programmatic or umbrella agreement that describes general measures to be implemented by participants, but the specific required actions (and associated obligations) on any given enrolled property will depend on site-specific analysis of existing conditions.

Every Participating Landowner's site-specific plan will specifically describe in detail his or her obligations under the plan and the terms of the CCAA. An example of a site-specific plan is provided as Appendix G to the CCAA.

One specific obligation mentioned by one comment [6] is that flow measuring devices should be properly installed, calibrated and maintained. The proper installation, calibration and maintenance of flow measurement devices throughout the duration of a Participating Landowner's Certificate of Inclusion (enrollment in the agreement) is an implied requirement. The Service also notes that provisions in the Changed circumstances require that irrigation structures must be inspected for proper function following a 5-year flood event.

**Issue 9:** Prioritization of diversions for replacement, repair, fish screening, etc. Two commenters [6, 8] wondered how improvements to irrigation diversions would be prioritized.

**Reply:** A prioritization scheme for determining the order of implementing specific conservation projects was included in the CCAA (p. 67). Prioritization criteria include presumed habitat use by grayling adjacent to enrolled lands, entrainment, extent of irrigated lands to be enrolled (i.e., surrogate for amount of irrigation water diverted) and extent of riparian habitat. Since irrigated acreage is generally proportional to diversion amounts, those landowners that can provide more water for beneficial instream uses would receive a higher ranking.

**Issue 10:** Active channel restoration. One commenter [5] urged the CCAA partners to consider more aggressive channel restoration methods.

**Reply:** The CCAA presumes that improved channel morphology (e.g., decreased width:depth ratios, increased pool frequency, etc.) will result from restoring processes of sediment erosion and deposition (fluvial processes) through reestablishing a more "natural" hydrograph and conserving and restoring riparian habitats. These changes may require considerable time, and the CCAA acknowledges that active channel restoration may be required in some instances where natural channel adjustment may not occur rapidly enough to meet the more immediate habitat needs of Arctic grayling (pp. 45 and 80 of CCAA).

**Issue 11:** Landowner compliance with requirements of the CCAA and enforcement in situations of noncompliance. Specific comments included clarifying agency responsibilities for monitoring irrigation diversions [1], a suggestion that a periodic audit of landowner compliance was necessary [5], a request for "random" compliance inspections [6], a request for mandatory annual or biannual meetings between MFWP and participants [6], a request for annual reporting of compliance with "diversion agreements" [8], and general concerns with how compliance would be enforced and if Certificates of Inclusion would be suspended [5, 7].

**Reply:** The Service agrees that monitoring and enforcement of irrigation diversions will be a critical to successful implementation of the proposed CCAA. The MDNRC, which has expertise in water resources and State water law, will have the primary obligation to monitor

compliance with irrigation diversions agreed to under any site-specific plan and monitoring streamflows in the proposed management segments. The MFWP, as the proposed Permit holder, will have overall enforcement responsibilities for site-specific plans and the CCAA.

The Service is obligated to maintain an oversight role for the proposed CCAA through its Ecological Services division whereby it may suspend or revoke the Certificate of Inclusion of any landowner that been document to be in noncompliance with the agreement or their site-specific plan. The Service will be directly involved in implementation and monitoring of the CCAA through its Montana Partners for Fish and Wildlife program. The MFWP is required to produce annual reports of CCAA progress, including compliance, so the Service will have both ongoing and annual assessments of Participating Landowner compliance. The Service also may revoke the Enhancement of Survival Permit if the terms of the permit are not being properly implemented.

The CCAA describes agency obligations for compliance monitoring (e.g., MDNRC will monitor irrigation diversions and compliance with water rights, NRCS will monitor compliance with grazing plans, etc.) and requires landowners to permit access by MFWP personnel or its agents for this purpose. These obligations are described throughout the agreement and most specifically beginning on page 69 ("Obligations of the Partners") and page 74 ("Monitoring and Reporting"). Compliance monitoring will be ongoing on all enrolled properties throughout the duration of the CCAA, therefore the compliance monitoring program does not require a random-sampling or limited-notification component.

The provision that Participating Landowners are required to meet twice annually with MFWP (or a surrogate) is mandatory, but was not clearly stated as such in the draft CCAA. The text of the CCAA was changed to clearly indicate that these twice-annual (every 6 months) meetings are required and will be scheduled at a mutually-convenient date and time (see p. 76 of CCAA, "Landowner Contact").

Compliance with diversion agreements developed under any site-specific plan will be ongoing. Annual reports produced by MFWP will describe overall compliance, and records of compliance/noncompliance with specific components of site-specific plans (diversions, grazing plans, etc.) will be maintained in MFWP files. The annual report will describe overall compliance (or noncompliance) with the agreement and site-specific plans in its annual report (p. 77 of CCAA).

Under the "Obligations of the Partners" section (pp. 69-73), the CCAA specifically states that the Service or MFWP can revoke or suspend, in part or whole, a Participating Landowner's Certificate of Inclusion should they be documented to be in noncompliance with their site-specific plan or the Agreement. In effect, this provides a mechanism to enforce the requirements of the CCAA and remove assurances, for some or all covered activities, if the requirements are not being met. The Service also may revoke the Permit if the terms of the Permit are not being properly implemented.

Additional detail describing MFWP and Service enforcement actions in case of noncompliance with the CCAA has been included under the Obligations of the Partners for Participating Landowners, MFWP, and the Service; and under the Compliance Monitoring (pp. 69-73). The new text describes the written process for notifying landowners of noncompliance and provides a 7-day timeframe to return to compliance before possible suspension or revocation of the Certificate of Inclusion.

**Issue 12:** Specific definition of “properly functioning” irrigation diversions [commenters 1, 8]. Two commenters [1, 8] requested a more specific definition of properly functioning irrigation diversions.

**Reply:** Properly functioning irrigation diversion will be a vital technical requirement for the CCAA’s water conservation strategy. One commenter understood properly functioning diversion to mean that diversions are fully controllable (easily opened and close and do no leak when closed) and have measuring devices. We agree with this characterization of “properly functioning” (p. 27 of CCAA) and note that these characteristics were an implied requirement, because the CCAA describes water savings in terms of keeping ditches closed when irrigation is not permitted (outside of period of use for an associated water right) and reducing leaks (p. 27 of CCAA). The installation of fish passage or a fish screen will depend on whether the structure is a barrier to fish movement or is an entrainment threat, so these additional measures may not be necessary in all cases.

**Issue 13:** Prioritization of fish screening projects and cumulative effects. One commenter [5] suggested specific criteria (diversions >10 cfs), and another [8] expressed concern that installing fish screens on larger diversions may force grayling into dewatered natural stream channels.

**Reply:** The Service does not have sufficient data on Arctic grayling entrainment to justify installation of fish screens on all diversions above a certain arbitrary size. The high cost of fish screens and lack of information about the population-level impacts of entrainment can lead to inefficient use of public funds to conserve sensitive fish species where (Moyle and Israel 2005). Consequently, the CCAA describes a framework for measuring and evaluating the potential population-level threat to Arctic grayling from entrainment in irrigation, and prioritizes installation of fish screens based on these ongoing assessments.

The Service is not aware of any data indicating that entrainment may, in effect, benefit Arctic grayling in instances where a particular diversion takes most of the streamflow and leaves downstream habitat mostly dewatered. Conservation measures in the CCAA address threats to Arctic grayling from dewatering and entrainment, so it appears speculative to presume that installation of a fish screen will increase threats to grayling.

**Issue 14:** Estimated benefits to instream flows from the CCAA and predicted frequency of meeting minimum streamflow targets [commenters 1, 2, 5, 6, 7, 8].

**Reply:** The Service recognizes there is uncertainty regarding the predicted magnitude of increased streamflows from implementation of the CCAA. Unfortunately, providing a reliable, quantitative estimate of the expected benefit to instream flows resulting from

implementation of the CCAA is not possible given current information. The realized improvements to instream flows will depend on, among other things, the level of participation in the CCAA, the characteristics of the enrolled lands and associated water rights, climatic conditions, and the behavior of unenrolled landowners adjacent to the project area. Linking a collection of site-specific conservation actions to a “collective” goal such as streamflow at a certain location in the watershed requires numerous assumptions which impart additional uncertainty on any estimate. Nonetheless, the CCAA describe the potential to improve streamflows through incremental improvements on enrolled properties, such as by fixing leaking headgates and upgrading the efficiency of irrigation systems. The CCAA does consider the historical hydrograph in the Big Hole River during the period of record as a reference for the proposed flow targets, but as described above, it does not appear to be possible at this time to explicitly link anticipated flow improvements to these past conditions.

**A number of comments raised issue with the expectation that flow targets were expected to be met 75 percent of the time after 10 years of CCAA implementation. More specifically, comments pointed out potential technical problems with how the targets were presented, and stated that flow targets should be met 100 percent of the time or met in a sooner timeframe than 10 years.**

**Reply:** The Service agrees that the draft CCAA’s description of the flow targets was confusing: “The Agencies estimate that after 10 years of Agreement implementation, streamflows in the Project Area will meet or exceed target values at least 75 percent of the days between April-October in years with average snowpack....” The CCAA states that the Agencies will strive to meet or exceed the biologically-based flow targets presented on page 35, thus the Agencies are working toward meeting the targets 100 percent of the time during implementation of the CCAA. However, the effects climate (precipitation and timing of snowmelt runoff), cumulative drought, and the potential actions of nonenrolled water users in the upper Big Hole River basin make it unrealistic to expect that flow targets will be attained 100 percent of the time. Based on expert opinion, analysis and interpretation of the existing hydrologic data, and the expected improvements to streamflows under implementation of the CCAA, the Agencies have estimated that the targets will be met 75 percent of the time after 10 years of implementation.

The draft CCAA did not clearly state that this expectation applies both spring **and** summer-fall periods. That is, the targets are to be met in both the spring (April-June) **and** summer-fall (July-October), not just in one or the other or a total number of days between April-October. The text has been changed on page 36 of the CCAA (“...will meet or exceed target values at least 75 percent of the days during the spring period and during the fall and summer period.”). Meeting targets in both spring and summer-fall clearly is an attempt to insure adequate flows for spawning, rearing, feeding, and movement for fluvial Arctic grayling throughout the year.

The Service also notes that the presentation of flow targets with a threshold for “success” would mean that an average flow of 1 cfs less than the target on a given day would technically constitute “failure,” even though a difference of 1 cfs may be biologically insignificant for grayling. The Service does recognize that this success/failure formula for



instream flow targets in the five management segments may be overly rigid. However, the flow targets are **minimum values** established under a standard-setting method (wetted perimeter inflection point) and this method does not explicitly consider the frequency of meeting these values or the effect of variability around these targets.

A few commenters requested that the CCAA include some “safety net” for minimum streamflows [7] or wondered what improvements would be expected when basin snowpack conditions were below average [5]. As stated earlier, the flow targets are minimum, standard setting values, so it is not biologically appropriate to establish lower targets. In addition to the suite of actions (e.g., irrigation system upgrades) designed to improve instream flows, the CCAA already contains a specific mechanism, termed “supplemental flow agreements” (formerly termed “interim irrigation diversion reduction arrangements”) (p. 28 and Appendix E of CCAA) whereby Participating Landowners reduce irrigation diversions further based on instream flow conditions (i.e., when streamflows are starting to decline such that grayling reproduction, rearing, feeding, etc., may be affected).

The comment that instream flows during years of below average snowpack or water availability will be important for Arctic grayling is correct, but (as with normal snowpack years) it is not possible at this time to reliably estimate streamflow improvements directly resulting from the CCAA. A reasonable expectation is that targets will be met less frequently during years of reduced snowpack. As stated previously, the implementation of the CCAA is expected to increase instream flows relative to past years for a given set of environmental conditions (i.e., baseline or average flows will increase). The Service expects that the “supplemental flow agreements” described above will be more frequently activated in years where snowpack conditions are below average and overall water availability for the basin is reduced. Thus, an additional mechanism to supplement instream flows in “poor” water years already exists in the CCAA.

A few commenters suggested that the flow targets be met sooner [1] and should be met or exceeded with 100 percent frequency [1, 8]. The intent of the CCAA appears to be just as the commenters suggested, namely to meet and exceed the targets with due haste--the parties to the CCAA “...will strive, through implementation of the conservation measures, to provide flows that exceed the minimum flow targets” (p. 35 of CCAA). While the operational goal is full attainment of targets, the expectation of meeting the targets “75% of the days after 10 years” reflects a rough estimate of anticipated incremental improvement to instream flow conditions after a decade of CCAA implementation. Given the uncertainty over the optimal flows required by Arctic grayling and the difficulty in estimating improvements to streamflow from the CCAA, the Service notes that too much emphasis may have been placed on this statement (i.e., “75% of the days”). The most meaningful measure of the CCAA’s effectiveness will be a biological response on the part of grayling, and the instream flows are one of the many factors can contribute to this response.

**A number of commenters expressed concern over why flow targets are expected to be met less frequently in Management Segment C [1, 6, 7].**

**Reply:** Several of the largest diversions on the mainstem Big Hole River are located immediately above the Wisdom gage at the bottom of Segment C. As a result, a large amount of water gets diverted around the gage to irrigate lands hydrologically connected to the river reach downstream of the gage. In addition, the river reach immediately above the Wisdom gage is known to lose water through natural seepage during low water years. Because of this situation, unique only to the Wisdom gage, meeting targets at Segment C will be more difficult than at the other four segments. The Service does not view the qualifications about meeting flow targets at a lower frequency in a particular management segment as an indication that the CCAA is establishing lower standards or specific exceptions, rather it views these statements as a reasonable interpretation of the data in the context of the hydrologic conditions that exist in Management Segment C.

One commenter suggested including in the CCAA a metric to determine success of meeting flow targets in multiple-year increments (e.g., meeting targets in 3 of 5 years) [6]. The comment's intent is valid in that it seeks guarantee improved flows across time so that the effect of a few poor water years on reproduction and survival will be buffered by better years. However, interannual variation in water availability is largely a function of climate (snowpack, precipitation, etc.) which is not controllable under the CCAA. The CCAA will increase the frequency of meeting flow targets under a given set of conditions, but in practice it would appear difficult to ensure interannual consistency in meeting targets. For example, if the targets were not met in 2 consecutive years, it would be imperative to attain the targets in the third year to stay on course to meet the "3 of 5 years" goal. If the third year also is an extreme drought, the CCAA would ensure flow conditions would be better than if the CCAA were not being implemented, but its ability to reach the flow targets is ultimately constrained by the amount of water available in the basin.

While having an interannual target (3 of 5 years) would be a difficult operational target to implement under the CCAA, this metric can perhaps be useful for retrospective analysis of past conditions and as a prospective benchmark for success of the CCAA. For example, retrospective analysis of data from Management Segment C indicates that 3 of 5 years has not been achieved during the 18-year period of record for the Wisdom streamflow gage. At the Wisdom gage, summer/fall target success has exceeded 75 percent on 3 out of 18 years. There has not been a 5-year period during which 3 years exceeded the summer/fall flow

targets 75 percent of the time. If 5-year increments are examined, the following table represents the most and least successful 5-year increments based on the summer/fall flow targets at Wisdom.

	5-year Period	Years Targets Met 100%	Years Targets >75%	% Days Targets Met
<b>Most Successful</b>	1995-1999	1	2	67
<b>Least Successful</b>	2000-2004	0	0	19

Similar analyses could be done after implementation of the CCAA (and additional flow data collected) to measure the how the agreement increased the interannual frequency of meeting flow targets.

**Issue 15:** Ensuring conserved water remains in the river to benefit Arctic grayling and assisting landowners with the Montana State water law's change-of-use process [commenter 6].

**Reply:** The Service agrees with the comment that the agreement would be most effective if water conserved by Participating Landowners is protected from otherwise legal diversion by nonparticipating landowners. The commenters note that a change-of-use of water rights through the MDNRC would provide formal protection for conserved water. The Service also agrees that technical nature of State water law and the change-of-use process requires additional expertise to more effectively implement the CCAA. Accordingly, MFWP, MDNRC, and the Montana Trout Unlimited Water Project have agreed to form a Water Rights Technical Advisory Committee to formally advise the CCAA partners and Participating Landowners on a range of water issues. The Committee's mission will be to address concerns about water right compliance and law, to provide and protect suitable instream flows, and to develop strategies to ensure water contributions from negotiated water agreements remain instream. A paragraph describing the purpose and constituency of this advisory committee has been added to page 26 of the CCAA.

**Issue 16:** Effects of CCAA on groundwater storage in irrigated areas in the upper Big Hole River watershed. One commenter [3] who otherwise expressed strong support for the CCAA stated a concern that the Agencies were neglecting the potential effects to groundwater storage in the upper Big Hole River basin.

**Reply:** The Service acknowledges that reducing the amount of water diverted away from the Big Hole River may potentially affect ground- and surface-water dynamics. The MDNRC and the Montana Bureau of Mines and Geology have collected data on groundwater storage and irrigation return flows over the past 10 years. The most significant period of irrigation return flows in the upper river occurs during June and early July when soils are saturated with moisture and overland flow is common. Efficiencies of traditional flood irrigation systems in the upper Big Hole River basin are approximately 10-15 percent (Tim Griffiths, NRCS, Bozeman, Montana, pers. comm.). The CCAA is not expected to increase irrigation system efficiencies to the extent that groundwater storage would be affected, but rather to eliminate the substantial quantity of overland flows which occurs when soils already contain sufficient moisture content. The CCAA's proposed improvements to irrigation systems will increase the frequency of channel maintenance flows, decrease stream water temperatures and nutrient loading (by eliminating overland return flow), and maintain groundwater storage necessary to supplement stream base flows in the late summer and fall.

**Issue 17:** The proposed CCAA and the policy for evaluation of conservation efforts (PECE) when making listing decisions. One commenter [4] stated that the CCAA fails to meet the requirements of the PECE policy.

**Reply:** The PECE policy provides guidance to the Service for evaluation of conservation efforts **when making listing decisions**. A listing decision and issuance of an Enhancement of Survival Permit are separate and independent actions.

**Issue 18:** Design and methods for the proposed biological monitoring [commenters 5, 7, 8].

**Reply:** The proposed CCAA's Arctic grayling monitoring includes sample locations in currently unoccupied reaches (e.g., Management Segment A), so the monitoring design is minimally sufficient to detect an increase in the distribution of the population.

Concerns over catch-per-unit-effort (CPUE) to detect trends in Arctic grayling abundance and distribution are somewhat overstated. The comments correctly state that capture-mark-recapture and multiple-pass depletion electrofishing sampling are preferred population estimation methods having a stronger statistical basis. However, CPUE methods are widely used in fisheries monitoring (Thompson et al. 1998) and can be appropriately applied if a statistical relationship (correlation or regression) can be established between the CPUE index value and a corresponding abundance estimate (e.g., from capture-mark-recapture or depletion sampling). Preliminary analyses by MFWP indicate a strong correlation between CPUE and abundance at most long-term Arctic grayling monitoring sites in the Big Hole River. Consequently, CPUE appears to provide a valid index of abundance suitable to detect trends in abundance. However, more detailed analyses, such as regression, are required to develop a predictive relationship between CPUE and abundance.

Other reasons to justify use of single-pass electrofishing CPUE as a component of the Arctic grayling monitoring includes the broad spatial extent of sampling needed to detect an increase in the distribution of grayling and reduced handling and capture stress for the depressed grayling population.

The overall monitoring program includes a combination of CPUE (to detect trend) and capture-mark-recapture (to provide point estimates of abundance). The text of the CCAA has been changed on pages 58 and 74 clarify this point.

**Issue 19:** Public availability of annual CCAA report and related documentation and public reporting on CCAA implementation. Various commenters requested public updates of CCAA progress [1, 6], wider availability of annual reports [1, 5, 6, 7], public reporting of expenditures [1, 8], and public review of site-specific plans [6].

**Reply:** The MFWP is responsible for completing an annual report each year, and the date of this report has been moved up from May 1 to February 1. The Service agrees the annual report should be widely available to interested parties. The report will be made available via the internet on both State websites ><http://fwp.mt.gov/wildthings/concern/grayling.html>< the grayling recovery website >[www.graylingrecovery.org](http://www.graylingrecovery.org)<, and/or the Service's Region 6 Arctic grayling website ><http://mountain-prairie.fws.gov/species/fish/grayling/grayling.htm><. Page 77 of the CCAA has been updated to reflect that annual reports also will include

information on funds spent to implement CCAA projects and a summary of enforcement actions. The revised text also states that the annual report will be distributed to the Agencies and widely available to other interested parties via agency websites.

In addition to the written annual report, the MFWP will publicly report on the CCAA at the Workgroup/Recovery Program annual meeting, typically held in late February or early March.

Formal public review of the CCAA is limited to the proposed umbrella CCAA, the draft Environmental Assessment and the application for the Enhancement of Survival Permit. The CCAA policy does not require that site-specific plans developed under an umbrella or programmatic be released for general public review. However, specific projects proposed under individual site-specific plans may require public review under, for example, the Montana Environmental Protection Act or the NEPA. Public access to completed site-specific plans will depend on applicable State and Federal laws governing access to agency documents.

**Issue 20:** Ecological validity, presentation of assessment details, and proposed monitoring for NRCS' riparian assessment protocol [1, 8]. Commenters questioned the "ecological validity" of the NRCS' riparian protocol [1] asked for additional details on the protocol [1, 8], and requested higher riparian standards and more frequent monitoring [1, 8].

**One commenter suggested the NRCS riparian assessment system is not "Ecologically based" and may not relate to grayling [1].**

**Reply:** The NRCS Riparian Assessment Method is a modification of "Assessing Health of a Riparian Site" originally developed by the staff of the Montana Riparian and Wetland Research Program at the University of Montana (Thompson et al., 1998) which has been used and tested in several States and Canada since 1992. The assessment method is intended for use by trained field staff, consultants, and landowners for rapidly assessing the sustainability and function of a lotic (running water) riparian corridor. Sustainability and function of riparian areas is fundamental to channel stability and ecologic integrity in most cases.

The assessment method is designed to help users understand the physical attributes and processes that should occur in stream systems and their adjacent riparian areas. It is based on providing a "first cut" evaluation of stability and sustainability as a surrogate for riparian 'health.' The evaluation characterizes the physical and ecological attributes (geomorphic, vegetative and functional attributes) that represent thresholds for sustainability.

Subsequent ratings over a period of time on the same stream reach can be used to evaluate trend. The evaluation also leads to identification of recovery strategies and management needs that may be used to reverse a downward trend.

**Two commenters requested a description of the NRCS riparian assessment ranking tool and that the target riparian condition should be 95 percent rather than 80 percent [1, 8].**

**Reply:** The protocol's overall scoring system is categorical, and divides riparian habitat condition into Sustainable (score 80-100 percent), At Risk (50-80 percent), and Not Sustainable (<50 percent). Since the goal of the CCAA is to have all riparian corridors in enrolled lands attain Sustainability (index score ranging from 80-100 percent). Thus, the minimum target for the CCAA was set at 80 percent or the lower boundary of the Sustainable category. The riparian assessment's scoring system is not intended to give the user a quantitative and comprehensive analysis of all ecological and physical processes. Additionally, the rating is not intended to provide an absolute numeric value that can be used to compare the reach to other riparian/wetland areas.

The absolute number associated with the score is not as important as the overall category (Sustainable, At-risk, Not-sustainable). Sustainable riparian habitats have vegetative, physical and functional characteristics expected to have a positive influence on aquatic habitats through shading, providing overhead cover, increasing bank stability, etc., all of which should benefit coldwater fishes such as Arctic grayling.

The 10 assessment categories used in the ranking system are described on pages 41-42 of the CCAA and include: stream incisement, lateral bank erosion, sediment balance, streambank vegetation, riparian vegetative cover, noxious weeds, undesirable plants in the riparian area, woody species establishment and regeneration, tree and shrub utilization, and floodplain characteristics. Interested parties seeking additional information about the NRCS riparian assessment protocol can access the protocol through the internet at ><http://www.mt.nrcs.usda.gov/technical/ecs/environment/technotes/>< or contact the office at Natural Resources Conservation Service, 10 East Babcock Street, Federal Building, Room 443, Bozeman, Montana 59715-4704; Phone Toll-Free 866-880-NRCS (6727).

**Two commenters recommended that NRCS riparian assessments should occur every 2 years rather than every 5 years.**

**Reply:** The terms of the CCAA require NRCS to reassess riparian conditions on enrolled lands every 5 years for the duration of the site-specific plan. The minimum duration of any site-specific plan is 10 years, so riparian conditions will be assessed at least three times--at enrollment, at year 5, and at year 10. A landowner who enrolled for 20 years would have their riparian habitat 5 times. Response of riparian habitats to conservation actions (fencing, grazing management, growth of willows, etc.) may be gradual for some characteristics (e.g., incisement, lateral bank erosion), so incremental change may not be detected with such frequent sampling (i.e., every 2 years) and this would not be an efficient allocation of monitoring resources.

The Service notes that more frequent (annual) monitoring of channel morphology will be conducted by MFWP at each of 10 monitoring stations (see p. 71 of CCAA). Channel adjustments depend strongly on riparian habitat conditions (and streamflow), so monitoring of channel morphology will provide an indirect measure of riparian habitat function.

**Issue 21:** Concern that assurances and incidental take coverage will be provided to participants even if site-specific plans are not fully implemented. One commenter questioned whether a Certificate of Inclusion would remain valid in cases where “limited resources” may limit implementation or where timelines were not being met [6].

**Reply:** For a landowner to hold a valid Certificate of Inclusion and receive assurances and incidental take coverage, site-specific plans must be fully implemented according to timelines established in the CCAA and the site-specific plan. Failure to implement CCAA and site-specific plan provisions will result in suspension or revocation, in part or in whole, of the Certificate of Inclusion and/or the Enhancement of Survival Permit by the Service or MFWP (pp. 69-73 of CCAA). For example, if for whatever reason, the riparian restoration plan was not being implemented on a given property but the other components of the site-specific plan were being fully implemented, then the incidental take and assurances associated with the riparian habitat could be suspended until such time as the riparian restoration plan was being fully implemented.

**Issue 22:** Concern that funding and agency staffing will not be sufficient to fully implement the CCAA. A few commenters expressed concern that current agency staffing needs to be maintained so that projects will be implemented [5, 8] or wondered about the sources of funding that will be used to pay for these projects [2, 5].

**Reply:** The Service agrees that full and timely implementation of the proposed conservation measures will be the most effective approach to implement the CCAA and benefit Arctic grayling. The actual staffing levels and project funding required to fully implement the CCAA are unknown at this time; however, the partner agencies have formally indicated their dedication to the CCAA and the pursuit of funding necessary to complete the necessary projects. For example, in October 2005 the MFWP, NRCS, and MDNRC signed an MOA (MFWP et al. 2005) that formalizes their commitment to implement the CCAA and provide dedicated staff to that end. Project funding depends on agency budgets and ability of the CCAA partners to obtain dedicated project funding. Appendix C of the CCAA describes possible sources of project funding, and the Service expects that additional sources of funding and project partners will be identified.

As described in the reply to Issue 21, the Certificate of Inclusion and its associated assurances and incidental take coverage are only valid if Agencies and Participating Landowners are meeting the requirements of the CCAA and the site-specific plans.

**Issue 23:** General concern about the need for more benchmarks and measurable objectives [commenter 6].

**Reply:** The CCAA already contains a suite of measurable objectives for conditions on enrolled properties and “collective” objectives that, if not achieved, will trigger additional conservation actions on the part of landowners and the agencies. For example, the CCAA requires additional actions if riparian conditions on enrolled lands will not reach the “sustainable” level (per NRCS assessment protocol) within 15 years of enrollment. The CCAA presents minimum streamflow targets across the project area and anticipated

population responses that, if not achieved within a specified (see CCAA pp. 37 and 59). Additional benchmarks and measurable objectives suggested by the commenter (e.g., recovery goal for grayling, additional targets for streamflows) are addressed elsewhere in the response to comments. Overall, the Service has concluded that the targets and objectives described in the CCAA are adequate to meet the "CCAA standard" and CCAA issuance criteria.

**Issue 24:** Numerous commenters requested more rapid completion of site-specific plans and implementation of conservation measures [1, 5, 6, 7, 8, 10].

**Reply:** The Service is in broad agreement with the comments that full and immediate implementation of the proposed CCAA will substantially improve the status of fluvial Arctic grayling in the upper Big Hole River. The proposed CCAA describes the process by which the agreement will be implemented (pp. 62-66) and the timelines to implement specific components of the plans, for example how quickly flow monitoring devices will be installed, fish screens will be installed, etc. The proposed CCAA also includes a table that describes the expected timeline for improving Arctic grayling habitat under the implementation timeline (p. 61).

However, a general concern expressed in a number of commenters is that a number of these actions will not be taken quickly enough. For example, a number of commenters stated that Phase II of the implementation (development of the comprehensive site-specific plan) should be 18 or fewer months, instead of 30 months [1, 5, 6, 8]. Similar representative comments can be found with respect to replacing irrigation diversions [1, 5, 7, 8]. In some of these comments, the CCAA's proposed timelines are referred to as "unacceptable" or "too long." The Service recognizes that commenters are concerned with the status of the grayling and want the proposed CCAA to be implemented with all possible haste. The implicit assumption is that faster implementation is better, but the comments provide no factual or scientific basis for stating the CCAA's proposed timelines are inadequate (or conversely, why the commenters suggested timelines will provide measurably different results vs. the CCAA's proposed timelines).

The geographic extent of the proposed CCAA is large (>380,000 acres and 80 river miles), and preliminary landowner interest suggests the Agencies will be responsible for developing site-specific plans for 40 landowners holding over 200,000 acres. The CCAA contains a

general prioritization scheme so that conservation measures are first implemented on properties with the potential to provide both immediate and long-term benefits to grayling (pp. 67-69).

These comments seem to assume the scenario where all site-specific plans take the maximum amount of time to develop and implement. This appears unlikely. It is reasonable to expect that development of some complex individual site-specific plans (having significant resource concerns, covering large areas, numerous water rights, etc.) may indeed be developed and implemented according to the timelines proposed on pages 62-66. Simply stated,



development of a credible and robust conservation plan for a large ranch will require significant amount of time. However, many site-specific plans may be for smaller properties or be inherently less complex, so may be completed more rapidly than the proposed timeline.

Similarly, the comments also seem to imply that the Agencies will always take the maximum amount of time (relative to the proposed timelines) to complete a required task on any given enrolled property. In this context, the timelines are more reasonably interpreted as maximum timelines and the expectation is that all parties (Agencies and landowners) will attempt to complete all tasks in less time than proposed. In fact, implementation of activities required under the proposed CCAA has already begun in the project area. Under a 2005 special initiative EQIP in the upper Big Hole River Watershed, NRCS has written contracts and begun to replace a number of irrigation structures to improve control over water and remove obstructions to fish passage. More specifically, the NRCS has contracted with 17 landowners to replace 65 irrigation headgates, 51 irrigation diversions with fish ladders, 52 flow measuring devices, and 7 fish ladders. Installation of all structures is scheduled to be completed during 2006-2007. The NRCS also has initiated comprehensive assessments of ranches whose owners expressed willingness to participate in the CCAA. The NRCS estimates that 17 plans covering over 118,000 acres in the upper Big Hole River watershed will be completed by fall 2006. These assessments and the resulting conservation plans will be a major component of each Participating Landowner's site-specific plan under the CCAA. The NRCS plans an additional EQIP program in 2006, with \$250,000 obligated, to offer landowners the opportunity to install irrigation headgates, fish ladders on irrigation diversions, riparian fencing, and off-stream livestock watering facilities.

The MFWP has conducted rapid assessment surveys (see p. 59 of CCAA) and identified a number of possible barriers to grayling movement in the project area (Petersen and Lamothe 2006). The MDNRC has installed equipment so that all of the proposed management segments have remote streamflow monitoring capability and has been gathering information on water use on agricultural lands in the project area. Collectively, these ongoing efforts involving the CCAA partner agencies and landowners prior to implementation of the CCAA indicate that in some cases site-specific plans may be completed, and required conservation measures implemented, more quickly than described in the CCAA.

Comments questioning the proposed timelines perhaps assume that no conservation activities will be occurring on enrolled lands while site-specific plans are being developed (i.e., during Phase II of implementation, p. 62). The Service notes that a host of conservation actions (or supporting activities) are ongoing during development of site-specific plans (see pp. 64-65). For example, Participating Landowners must eliminate immediate threats to grayling, adhere to their water rights, and implement "interim irrigation arrangements" to conserve additional water to benefit grayling. The Agencies remain engaged with landowners through enforcement of the agreement, data collection for the site-specific plan, and monitoring.

**Issue 25:** Thermal loading is identified as a threat to Arctic grayling in the Big Hole River, but targets for stream temperature are not included in the proposed CCAA. Two commenters [1, 8] requested that the CCAA refer explicitly to water temperature information or thermal targets suggested by an ongoing analysis of the upper Big Hole River under the Clean Water Act.

**Reply:** Two comments noted that the upper Big Hole River is currently undergoing water quality evaluation and development of total maximum daily loads (TMDLs) pursuant to the Clean Water Act, and requested a more explicit integration of facts or recommendations from the TMDL process into the CCAA program. The Service observes that the two programs (TMDL and CCAA) are complementary and mutually reinforcing, but need not be perfectly coordinated or have identical targets to be individually or collectively successful. The draft TMDL reports indicate that thermal loading compromises beneficial uses of the upper Big Hole River (Confluence Consulting et al. 2003; Confluence Consulting, unpublished data), and TMDL information is cited in the draft CCAA. The Service has previously determined that high summer water temperatures may reduce the growth and survival of fluvial Arctic grayling in the Big Hole River. Elevated stream temperatures in the Big Hole River likely result from a combination of reduced streamflows, loss of riparian vegetation that provides shading, and changes in channel geometry (conversion from multiple to single-thread channel, increased width:depth ratios) that result in increased scope for solar heating. Preliminary analyses conducted using the Stream Segment Temperature Model reinforce the conclusion that riparian vegetation, streamflow, and channel geometry exert significant influence on water temperatures in the Big Hole River (Confluence Consulting, unpublished data). The CCAA proposes to increase streamflows, conserve and restore riparian habitats and restore more natural channel morphology and fluvial processes; and thus directly reduces or eliminates the conditions that have lead to elevated stream temperatures. While differences in detail and emphasis may exist between the proposed CCAA and the ongoing TMDL evaluation and recommendation, the general goal of reducing stream temperatures by addressing the proximate causes seems to be shared by both efforts.

A draft TMDL report also proposes water temperature targets intended to provide optimal growth and limit thermal stress for Arctic grayling based on data from a surrogate species, bull trout (*Salvelinus confluentus*) (Confluence Consulting, unpublished data). One comment recommended using these thermal targets in the CCAA. As stated above, the proposed CCAA addresses the currently-believed causes of thermal impairment, so targets for streamflows and riparian habitat conditions can be viewed as surrogate targets by which to produce more suitable thermal conditions for grayling in the Big Hole River. Thus, having specific thermal targets in the CCAA may be somewhat redundant and difficult to implement. While explicit thermal targets need not be included in the proposed CCAA, the Service recognizes that the thermal targets ultimately adopted under the TMDL process may serve as a useful benchmark to assess changes in stream water temperature concurrent with implementation of the CCAA, and vice versa. Collection of stream temperature data in monitoring is a requirement of the proposed CCAA (p. 75 of CCAA).

## Literature Cited

Confluence Consulting, Inc., DTM Consulting, Inc., and Applied Geomorphology, Inc. 2003. Upper Big Hole River Watershed Planning Area Phase 1 TMDL Assessment. Report to Big Hole River Watershed Committee, Big Hole River Foundation, and Montana Department of Environmental Quality. 95 pp.

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## **EXHIBIT G**

The permit with these Terms and Conditions will be issued once the CCAA is signed.



**Permit TE-104415-0**

**TERMS AND CONDITIONS FOR  
Montana Fish, Wildlife and Parks  
Candidate Conservation Agreement with Assurances**

Species: Arctic grayling (*Thymallus arcticus*)

This Permit authorizes the staff of the Montana Fish, Wildlife and Parks (MFWP) (the Permittee) to conduct activities on property in the upper Big Hole River watershed, Montana, enrolled in a Candidate Conservation Agreement with Assurances (CCAA) under the following conditions:

- D. Permittee named on the face of this Permit is responsible to ensure that the activities of all individuals are in compliance with the terms and conditions of this Permit.
- E. The authorization granted by this Permit is subject to:
  - 1. Full and complete compliance with, and implementation of, the CCAA and all specific terms and conditions contained in this Permit. These Permit terms and conditions supersede and take precedence over any inconsistent provisions in the CCAA or other documents associated with the Section 10(a)(1)(A) Enhancement of Survival Permit.
  - 2. Full and complete compliance with any applicable local, State, or Federal law, regulation, or restriction governing the site and those conservation practices and monitoring activities (as described within the CCAA) pertaining to, but not limited to, fish and wildlife, land and water use, water quality, air quality, local economy, and cultural and historic resources.
- F. Compliance with all necessary and required Permits and licenses applicable to the fulfillment of the CCAA.
- G. This Permit authorizes conservation measures, agricultural and ranching activities, and biological monitoring as specified in the CCAA (i.e., covered activities) that may incidentally take fluvial Arctic grayling and/or reduce grayling habitat on or adjacent to enrolled properties to a predetermined level as identified in the Service's conference opinion. The predetermined level of incidental take from conservation measures and agricultural and ranching activities is established as full adherence and compliance with site-specific plans and the requirements of the umbrella CCAA. That is, the amount of incidental take exempted for these activities is that which occurs when participating landowners, MFWP and the cooperating agencies (Montana Department of Natural Resources and Conservation, USDA Natural Resources Conservation Service, and the Service) are fully implementing Service-approved site-specific plans that are designed to reduce threats to fluvial Arctic grayling in enrolled lands and are in full compliance with the requirements of the umbrella CCAA. Consequently, non-compliance with a site-specific plan or the umbrella CCAA may mean the level of exempted take has been exceeded and the protective coverage of section 7(o)(2) may lapse. Incidental take from biological monitoring of fluvial Arctic

grayling by Montana Fish, Wildlife and Parks shall be no more than 15 mortalities per year. The Service anticipates that actual mortalities from such monitoring will be negligible based on the experience and precautions taken by MFWP professional staff.

Take is authorized to the extent that take of this species would otherwise be prohibited under section 9 of the Endangered Species Act and its implementing regulations, or pursuant to a rule promulgated under section 4(d) of the Endangered Species Act. Take must be incidental to otherwise lawful activities on the enrolled lands in the upper Big Hole River watershed in Montana and must be consistent with implementation of the CCAA.

If take levels are met or exceeded as described in the conference opinion, the Service and MFWP will identify and implement additional protective measures, as applicable, to minimize any further incidental take. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. Covered activities may continue during the reinitiation period, provided that all the protective measures proposed in the CCAA and the terms and conditions of the conference opinion have been and continue to be implemented and the ongoing take does not exceed the level specified in the existing conference opinion.

- H. Permittee is authorized to extend the provisions of this Permit to non-Federal landowners who enter into a Certificate of Inclusion (COI) with the Permittee and have a site-specific plan approved by both the Permittee and the Service, as well as their successors in interest. The following eligibility requirements are mandatory prior to: (a) COI being issued from the Permittee to a participating landowner which provides incidental take exemption and; (b) approval of a site-specific plan under the CCAA which extends the incidental take exemption and provides regulatory assurances:
1. Landowner owns real property within Montana that is located within the project area defined by the CCAA.
  2. The Permittee will allow the Service 30 days to review each COI; suggest any modifications (as appropriate) to ensure consistency with the CCAA, the CCAA policy, and any applicable local, State and Federal laws and regulations; and concur with the COI through signature of the appropriate Service representative (e.g., Montana Field Supervisor or Acting Montana Field Supervisor). A COI shall be considered valid (executed under the CCAA) when it bears the signatures of the participating landowner, MFWP and the Service.
  3. The Permittee will allow the Service 30 days to review each site-specific plan; suggest any modifications (as appropriate) to ensure consistency with the CCAA, the CCAA policy, and any applicable local, State and Federal laws and regulations; and concur with the site-specific plan through signature of the appropriate Service representative (e.g., Montana Field Supervisor or Acting Montana Field Supervisor). A site-specific plan shall be considered valid (executed under the CCAA) when it bears the signatures of the participating landowner, MFWP and the Service.
  4. The Permittee shall provide the Montana Field Office with copies of each executed COI and site-specific plan within 14 days of final approval.

- I. This Permit is issued for a period of twenty (20) years, and only provides for incidental take of fluvial Arctic grayling in the upper Big Hole River watershed as specified in the CCAA and conference opinion. The Permit may be renewed at the end of the Permit period, should the Permittee and the Service agree.
- J. Upon enrolling in the CCAA the participating landowner agrees to allow the Permittee, Service, or mutually agreed party, after reasonable prior notification, the right to enter onto the property for the purposes of implementing and determining compliance with the CCAA.
- K. Upon locating any dead fluvial Arctic grayling in the project area, the MFWP will, within 14 days, notify the Service's Montana Field Office (406-449-5225) of the number and disposition of specimens. The Service recommends that dead specimens be preserved or retained by MFWP for future analysis. Incidental take through mortality and harm (activities impairing essential behavioral patterns including breeding, feeding, or sheltering [i.e., habitat loss or modification]) will be reported annually along with an annual report of incidental take as specified in the CCAA.
- L. The MFWP and enrolled landowners will refer to Permit number TE-104415-0 in all correspondence and reports concerning Permit activities. Any questions you may have about this Permit should be directed to Montana Field Supervisor, U.S. Fish and Wildlife Service, 585 Shepard Way, Helena, Montana 59601 or at the above mentioned number.
- M. The Permittee will notify the Service at least 30 calendar days in advance of any planned activity that a landowner or the Permittee reasonably anticipates will result in take (i.e., death, injury, or other harm) of fluvial Arctic grayling on the enrolled property, and provide the MFWP and Service the opportunity to capture and/or relocation of any potentially affected species, if appropriate. If 30 days notice cannot be provided, notification should be made immediately upon recognition that take will occur.
- N. The landowner or Permittee will notify the Service of any transfer of ownership of the enrolled lands, so the Service and/or Permittee can attempt to contact the new owner, explain the conservation measures applicable to the enrolled property, and seek to interest the new owner in signing the existing COI or a new COI to benefit the covered species. The Permittee may elect to contact the new owner and report the new ownership and any changes in the COI to the Service in the annual report. The Permittee will provide the information described in 50 CFR § 13.25 (section of the regulation that addresses transfer of Permit and scope of Permit authorization) to the Service. The Service shall evaluate such information expediently so that the Permit can continue to cover all activities described in it.
- O. The Permittee shall provide an annual report to the Montana Field Supervisor, U.S. Fish and Wildlife Service, 585 Shepard Way, Helena, Montana 59601, telephone 406-449-5225, fax 406-449-5339, due no later February 1 of each year that minimally includes: (1) a summary of Certificates of Inclusion issued and site specific plans approved over the past year; (2) a summary of the grayling entrainment surveys and rescue efforts, (3) a summary of the estimated take from the implementation of conservation measures, monitoring activities, and any other take obviously resulting from land and water use related to the CCAA's covered activities; (4) a summary of projects related to the conservation measures described



in the CCAA, including an accounting of project expenditures; (5) the results of completed biological, habitat project performance and compliance monitoring; (6) recommendations for future management activities consistent with the CCAA; and (7) a summary of enforcement actions associated with landowner compliance with site-specific plans.

- P. Acceptance of this Permit serves as evidence that the Permittee understands and agrees to abide by the terms and conditions of this Permit and all applicable Sections of 50 CFR 13, 17, and 21 pertinent to issued permits.